



1310 Point Street  
8<sup>th</sup> Floor  
Baltimore, MD 21202

November 21, 2016

Mr. Jordan Garfinkle  
Massachusetts Department of Environmental Protection  
One Winter Street  
Boston, MA 02108

***Re: Exelon Corporation's Comments on the Massachusetts Department of Environmental Protection's Proposed Draft Regulation to Implement a Clean Energy Standard***

Dear Mr. Garfinkle:

In 2014, the Massachusetts Department of Environmental Protection ("Department") solicited input on the discussion draft for a proposed Massachusetts clean energy standard ("CES"). On November 3, 2014 Exelon Corporation ("Exelon") submitted comments on the 2014 discussion draft; however, the 2014 discussion draft did not proceed to a final rulemaking. Below are Exelon's comments on the next iteration of the proposed Clean Energy Discussion Document ("2016 Discussion Draft"). Through its affiliate, Constellation NewEnergy, Exelon is one of the leading retail electricity providers in the Commonwealth and, as such, would be directly impacted by a CES. Accordingly, we are pleased to offer the following comments.

**Introduction**

At the outset, Exelon would like to thank the Department for providing the Discussion Draft and convening a stakeholder forum in advance of issuing a proposed rule. In seeking to meet its GHG reduction goals under the Massachusetts Global Warming Solutions Act, a CES can provide a simple, efficient and cost-effective means of reducing carbon emissions at reasonable cost. Exelon believes a properly designed CES can be an effective, market-based approach to GHG reduction. We also commend the Department for looking to the existing renewable portfolio standard (RPS) regulations adopted by the Department of Energy Resources in developing the 2014 discussion draft as well as the current Discussion Draft. Adopting a consistent and familiar platform for the CES will minimize confusion and simplify compliance for Retail Electricity Sellers. In particular, the adoption of banking provisions and provisions for making CES Alternative Compliance Payments have proved important features of an RPS for Retail Electricity Sellers and we strongly support their inclusion in CES regulations.

In terms of the key policy questions identified by the Department, Exelon addressed in 2014 the critical aspects of resource vintage and technology as they relate to reliability and we also offered our thoughts on the need to adopt an exemption for certain existing retail electric supply contracts. We believe those comments remain relevant to the current Discussion Draft, and we offer them again below.

## **Eligible Resource Technologies**

Exelon would also like to commend the Department for again including nuclear resources as Clean Generation Units in the Discussion Draft, and we strongly disagree with the suggestion put forth at the stakeholder session that nuclear resources be excluded. Exelon is proud to be the leading owner and operator of nuclear generation in America. We produce more than one quarter of the clean nuclear power in this country and are dedicated to sustainability, having both established and exceeded our own corporate sustainability goals (as set forth in Exelon's annual sustainability report and can be found at: [http://www.exeloncorp.com/sustainability/Documents/dwnld\\_Exelon\\_CSR%20\(1\).pdf](http://www.exeloncorp.com/sustainability/Documents/dwnld_Exelon_CSR%20(1).pdf)).

Exelon believes that nuclear power as a clean, safe, and reliable source of energy and is an essential resource in meeting the world's climate goals. As Dr. Susan Tierney stated in the Wall Street Journal just one week ago:

In the near term, existing nuclear plants are vital to hitting our carbon-reduction targets. We need them to help transition the power system to a lower-carbon profile. And getting it right economically is essential to many people's willingness to pull carbon out of the system. WSJ, 11/14/2016 *Is Nuclear Power Vital to Hitting Emissions targets*.

For these reasons Exelon strongly encourages the Department not to exclude nuclear power from eligibility.

## **Resource Vintage and Technology**

The Discussion Draft proposes the use of a cut-off date for qualification as a Clean Generation Unit that would exclude generation resources brought online prior to such date. This practice, known as "vintaging," creates a number of problems for the marketplace.

Vintaging makes it difficult for all clean energy resources to compete fairly and effectively in the marketplace. Firms who developed resources after the vintaging date will enjoy a permanent, ongoing competitive advantage over older resources, even though they may make no greater contribution to carbon abatement. This can lead to retirement of otherwise cost-effective resources and their replacement with newer resources, resulting in no net environmental benefit. Simply put, the problem with vintaging is that it proceeds from the flawed assumptions that existing resources are not at risk for retirement nor will they be put at risk as a result of competitive pressure from new resources. In order to effectively meet environmental policy goals, all resources relied upon to meet those goals should be treated equally in the marketplace. A compelling case in point to illustrate this is Vermont. The premature closing of the Vermont Yankee nuclear facility has set Vermont back in meeting its goals for carbon reductions over the next several decades. Forbes Magazine describes the situation as follows:

*But 2012 and 2013 saw no progress on carbon, with Vermont's emissions almost exactly the same as the 8 million tons in 1990. "We have missed the 2012 goal," said Deb Markowitz, the Secretary of the Agency of*

*Natural Resources. "So now the focus is on 2050." And those carbon predictions were with Vermont Yankee's avoidance of a million tons of carbon a year. The state's 2028 emissions goal of 4 million tons is a pipe dream without Vermont Yankee, which is why they're now focusing on 2050.*Closing Vermont Nuclear Bad Business for Everyone, Forbes Magazine, September 19, 2014.

The Department's own presentation on the CES acknowledges that the cumulative effect of retiring all three of the Commonwealth's coal plants, Brayton Point, Salem Harbor, and Mount Tom, will not offset the loss of the Pilgrim Nuclear Station from a carbon standpoint and will mean a net increase in carbon emissions from the Massachusetts generation fleet. In short, policies for the benefit of new clean energy resources should not be pursued without regard to the impact that those same policies will have on existing clean energy resources. For these reasons we strongly encourage the Department to include existing as well as new resources within any CES it may adopt.

### **Grandfathering**

When a Massachusetts retail customer contracts with a Competitive Electric Supplier to purchase energy at a fixed price and over a fixed term, the supplier will include the cost of power as well as RPS compliance in the contract price. At the time of contract execution the supplier will purchase "hedges" in the form of wholesale power supply contracts and Renewable Energy Certificates to meet the expected load of the retail customer over the fixed price term. The subsequent imposition of a new requirement, such as a CES, upon the retail sale of electricity imposes an unanticipated cost upon the supplier which was not included in the contracted fixed price. Unlike a regulated utility, a competitive supplier does not have the ability to petition the Department of Public Utilities for a rate increase to cover the additional cost. The supplier is bound to the terms of the fixed price contract. The consequence, therefore, is the imposition of business losses on retail suppliers and the potential for disputes with customers over the exact terms of contracts which did not anticipate the changed obligation.

Over the years this very same dilemma has been encountered in connection with a number of statutory and regulatory amendments to the RPS in Massachusetts. To alleviate the situation the legislature and the DOER have routinely exempted or "grandfathered" electricity sales under contracts that pre-date the adoption of the new requirement. As the contracts roll off over time the amount of exempt load shrinks and eventually vanishes. Under this transitional approach expectations in the marketplace are preserved and new RPS requirements are in time fully applied. Our experience with the RPS exemption process for RPS changes has been positive and in considering adoption of a CES we encourage the Department to consult with the DOER and consider a similar process here.

## **Conclusion**

Again, thank you for the opportunity to comment and Exelon looks forward to continued participation in the process. Please contact the undersigned below if you have any questions.

Sincerely,

/s/Daniel Allegretti

Daniel Allegretti

Vice President, State Government Affairs – East

Exelon Corp.

1310 Point Street, 8<sup>th</sup> Floor

Baltimore, MD 21202

Office: 603 224 9653 | Mobile: 603 290 0040

[daniel.allegretti@exeloncorp.com](mailto:daniel.allegretti@exeloncorp.com) [www.exeloncorp.com](http://www.exeloncorp.com)



**From:** [taraanyaosah@rcn.com](mailto:taraanyaosah@rcn.com)

**Sent:** Friday, November 11, 2016 8:44:31 AM (UTC-05:00) Eastern Time (US & Canada)

**To:** Strategies, Climate (DEP)

**Subject:** gas leaks

Dear Department of Environmental Protection,

The Executive Order is an important and welcome first step. We appreciate it. The Governor has reaffirmed that climate change is a serious threat and that the Administration intends to meet the requirements of the Global Warming Solutions Act (GWSA).

That said, the Executive Order is not enough. Right now, we are **not** on track to hit the 2020 emissions reductions mandated by the GWSA. The Global Warming Solutions Act targets are not aspirational. They are legally required. The Supreme Judicial Court has ruled that the state has an obligation to put regulations in place that ensure we close the gap and achieve compliance by 2020.

We need specific plans and accurate accounting to ensure that the regulations created by the DEP get us to 25% below 1990 levels by 2020.

The current Clean Energy and Climate Plan (CECP) includes many key policies/programs intended to achieve compliance, but we are lagging in meeting 2020 targets and in implementing many of the measures contained in the plan.

Similarly, the new clean energy procurements included in the omnibus bill (hydro and offshore wind) are critical to helping MA transition to clean energy over the coming decades. But because those resources will not come online until after 2020, they will not help us meet the GWSA requirements.

We demand that you rapidly reduce green house gas emissions in the interest of protecting our children's and everyone's future. Gas leaks and new gas infrastructure should be a focus of these reductions. Fix the distribution system! Fix the super emitters! The Department of Environmental Protection should issue regulations that extend beyond 2020 on methane emissions to ensure continued reduction. DEP should also partner with independent researchers to help define "leaks of significant environmental impact." The administration should also factor GWSA impacts into decision making related to siting of new generation facilities and pipelines. Continuing to pursue new gas infrastructure is at odds with our need to comply with the GWSA.

Sincerely,

Tara Anyaosah

**From:** Dave B

**Sent:** Wednesday, November 16, 2016 11:55:36 AM (UTC-05:00) Eastern Time (US & Canada)

**To:** Strategies, Climate (DEP)

**Subject:** Gas leaks regulation

I am writing to express my concern about the number of gas leaks that have gone unattended by the utility companies in Massachusetts. Recently it has come to my attention that there are at least 177 Natural Gas leaks in the town of Arlington alone and approximately 20,000 statewide. There are streets in Arlington where one can actually smell the leaking gas. The methane from the Natural Gas leaks is bad for our health, bad for the plant life around us, adds to the warming of the planet and could pose a safety hazard. Also, we, the consumers, are the ones paying for lost and unaccounted for gas. For all these reasons, we need strict regulations to ensure that the gas companies fix all gas leaks. Identifying and fixing the largest leaks (the "super-emitters") should happen as soon as possible, but we also want all other gas leaks fixed in a timely manner. I personally have reported leaks that could be smelled and the gas company has been responsive. But there should be a coordinated campaign.

Sincerely yours,  
David Boccuti

# Climate XChange

November 9, 2016

Jordan Garfinkle  
Massachusetts Department of Environmental Protection  
[climate.strategies@state.ma.us](mailto:climate.strategies@state.ma.us)  
1 Winter Street  
Boston, MA 02108

## Statement for MassDEP Concerning its Proposed GWSA regulations and Executive Order 569, Nov. 7, 2016

Dear Mr. Garfinkle,

First, we want to thank MassDEP for having an open and transparent process in which the information on its plans was provided in some detail on its web site and then in oral presentations at the November 2 meeting. There remain some holes in the available data, but at least we can identify what those are and work on refinements. Below we provide comments that relate both to DEP's (and MassDOT's) plans for complying with the Supreme Judicial Court decision, and for implementing Governor Baker's Executive Order 569, that both responds to the SJC and takes pains to ensure that we meet the required 25 percent emissions reduction for 2020.

**Governor's Executive Order is an excellent step forward:** we greatly appreciate Governor Baker's Executive Order "Establishing an Integrated Climate Change Strategy for the Commonwealth." The Governor has reaffirmed that climate change is a serious threat; that the Global Warming Solutions Act (GWSA) sets legal limits on future greenhouse gas (GHG) emissions; that limits for 2030 and 2040 will be set, that the Administration will implement the ruling on May 17 of the Supreme Judicial Court by requiring the DEP to promulgate regulations in accordance with Section 3(d) of the Act by August 11, 2017; and that MassDOT must "establish declining annual aggregate emissions limits" for the transportation sector – our largest source of emissions.

**2020 mandate must be met:** while in some states the GHG reductions in climate plans are only "targets" or "goals," and are not legally binding; in Massachusetts the GWSA set **legally binding limits**, or percentage reductions from the 1990 emissions level. The Act said that the reduction for 2020 had to be between 10% and 25%, with the final number to be set by the Secretary of Energy & Environmental Affairs by the end of 2010. The Secretary set the requirement at 25%, and by his action this is now part of the GWSA. The state government and DEP have no discretion – the 25% reduction in emissions must be achieved.

**The state's current plans are not likely to achieve a 25% reduction by 2020:** The "2015 Update" to the Massachusetts Clean Energy and Climate Plan for 2020, issued by the Executive Office of Energy & Environmental Affairs (EEA) asserts that "the 2020 emission limit is achievable." (page 2) While we agree that it is achievable, we believe that the policies contained in the 2015 Update are unlikely to get us all the way there, both because several policies may not yield the emissions cuts anticipated by the Update (Table 2 on page 12) and because additional policies are needed. Problematic policies include:

**“GreenDOT”** – Table 2 shows this policy as achieving a reduction of 1.0 million metric tons of CO<sub>2</sub> equivalent (MMTCO<sub>2</sub>e) in 2020. Yet on page 83 of the Update EEA (or DEP) says “it appears that MassDOT will be short of its required GHG reductions.” DOT has acknowledged this problem. Meeting the requirements of the GWSA is the responsibility of the entire Administration, not just DEP, and so Governor Baker must order MassDOT to take the necessary steps to achieve the GHG cuts. See below for discussion of transportation policies that were included in the original Plan for 2020 and could help achieve the 25% reduction. **Since MassDOT’s actions are outside of DEP’s jurisdiction, and DOT did not make a presentation at the DEP hearing on November 2, we think it is essential that DOT hold its own hearing regarding its plans for reducing GHG emissions.**

**Clean Energy Imports** – the Update anticipates that such imports will yield 4.0 MMTCO<sub>2</sub>e in 2020. But EEA/DEP acknowledges that importing the large amount of power needed will require both legislation and the construction of “new transmission lines to deliver hydroelectric power and wind power from northern New England.” (page 32) We think that completion of such power lines is unlikely to be achieved by 2020; that legislation may not be forthcoming; and that a “Clean Energy Standard” as an alternative to legislation is unlikely to yield the 4.0 MMTCO<sub>2</sub>e cut by 2020.

**Reducing methane leaks from the natural gas distribution system** – the Plan Update shows these emissions having dropped from 2.0 MMTCO<sub>2</sub>e in 1990 to about 0.4 MMTCO<sub>2</sub>e in 2014. At the Nov. 2 hearing, DEP’s explanation for this drop was twofold: (1) emission factors for different types of pipes have changed since 1990, and (2) some fraction of the old pipes have been replaced since 1990. DEP says that the change in emission factors does constitute a “real” reduction in annual emissions. But without further evidence, it seems possible that much or most of this sharp drop in emissions is not real, but is due to improvements in measurement methodology. If the lower factors are due to such refinements, and these refinements would have been applicable in 1990, then the historical data should be revised. The text on pages 17 to 18 of DEP’s July 2016 GHG inventory update indicates the substantial effort that DEP has made to provide the best numbers possible with the available data.<sup>1</sup> But while replacement of cast iron with plastic pipes would explain part of the reduction since 1990, it may not be adequate to explain the 80 percent drop that the GHG inventory shows. If part of the 1.6 MMTCO<sub>2</sub>e drop from 1990 to 2014 is not real, then the overall emissions inventory could be significantly overstating the drop in emissions from methane leakage.

**New policies and expansion of existing policies:** the 25% emissions reduction can be met with expansion of existing policies and implementation of new policies; but given that only a few years are left until 2020 such policies will need to be carried out quickly. In some cases legislation will be needed, and it is the responsibility of the Administration to propose such bills. While there is not enough time for new policies to achieve their full impact by 2020, in all cases beginning now will help us to meet the mandates in 2030 and beyond. We recommend, for example:

**Carbon pollution fee-and-rebate:** there is worldwide recognition that adding a pollution fee to the price of fossil fuels and other sources of GHG emissions, in proportion to the amount of CO<sub>2</sub>e released when fuels are burned or other gases escape to the atmosphere, is the most

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<sup>1</sup> “Statewide Greenhouse Gas Emissions Level: 1990 Baseline and 2020 Business As Usual Projection Update,” MassDEP, July 2016, pages 17-18.

effective and cost-effective means of cutting GHG emissions. A study done for DOER in 2014 demonstrated that it is feasible to implement such a system in Massachusetts, and that if most or all of the revenues are returned to the public through rebates, there will be positive economic impacts on the state as a whole, on low- and moderate-income households, and on a large majority of business sectors.<sup>2</sup> This policy would require legislation, and could only be in operation for a couple of years by 2020, so its impacts by then would be limited, but it could yield reductions of several hundred thousand MMTCO<sub>2</sub>e in 2020.

**Aggressive pursuit of “All Cost Effective Energy Efficiency”** – this is already expected to yield larger gains than any other policy by 2020, but could yield more if the state’s electric and gas utilities chose to spend more money and work harder to expand adoption of efficiency measures for electricity, natural gas, and heating oil. Unfortunately, it appears that, at least in part because the utilities are allowed higher profit rates on investment in new supply infrastructure than on spending for efficiency, they are choosing **not** to pursue all cost-effective efficiency. Through DOER, through the large role that Administration appointees have on the Energy Efficiency Advisory Council (EEAC), and through other channels, Governor Baker could ensure that savings above the 5.4 MMTCO<sub>2</sub>e currently shown in the Plan are achieved. (Table 2, page 12)

In addition, another policy in the 2010 Plan would have the electric utilities expand their funding for efficiency programs directed at users of fuel oil for heat, from the residential sector where funding is already available, to the commercial and industrial sectors where it is not available. DEP states that legislation or new regulations would be required for this expansion, but does not recommend that such regulations be promulgated. This may fall in DOER’s territory – but again, fulfilling the GWSA’s mandates is the responsibility of the entire Administration, not just DEP, so Governor Baker should order that new regulations be issued.

**Transportation-sector policies:** The Update says that “While GreenDOT related GHG reductions identified by MassDOT appear to be short of this mark, the Baker-Polito Administration will enumerate transportation sector emission reduction measures sufficient to meet this goal. (page 29) We do not know what the Administration has in mind, but there are several policies in the original Clean Energy and Climate Plan for 2020 that are not currently being pursued but could be, such as:

**Eco-driving** – As consultants for the state on the original 2020 Plan, Cambridge Systematics estimated that “eco-driving” – optimizing vehicle driving and maintenance practices – could achieve savings of 1.1 MMTCO<sub>2</sub>e in 2020.<sup>3</sup> (document attached) The Update says: “The EPA estimates that smart driving can improve fuel efficiency by up to 33 percent, and EcoDriving USA estimates that Massachusetts’ drivers, with 5.4 million registered autos, could save about 4 MMTCO<sub>2</sub> e emissions annually if eco-driving practices were followed.” (page 85) But while the Update says that MassDOT will promote eco-driving (page 85), we have not seen evidence that MassDOT (or the overall state budget) intend to spend the substantial amount of money that would be needed to effectively educate drivers on the benefits of eco-driving (keeping to the speed limit on highways, accelerating more slowly, inflating tires correctly, etc.).

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<sup>2</sup> “Analysis of a Carbon Fee or Tax as a Mechanism to Reduce GHG Emissions in Massachusetts,” prepared for the Massachusetts Department of Energy Resources, Marc Breslow et al., December 2014.

<sup>3</sup> “GreenDOT Impacts,” Cambridge Systematics, April 6, 2010 (unpublished)

Achieving even a small fraction of 4 MMTCO<sub>2</sub>e would be a substantial contribution to reaching the 2020 mandate.

**Pay-by-the-mile auto insurance** – The original 2020 Plan estimated that charging for auto insurance in proportion to number of miles driven would substantially reduce driving mileage and could save up to 2.0 MMTCO<sub>2</sub>e.<sup>4</sup> But the state government (whether this occurred during the Patrick or Baker administrations is unclear) has dropped even the pilot program that MassDOT had signed a contract to have implemented, at least five years ago.

**Clean car consumer incentives** – The Update replaced the policy in the original Plan by incentives for purchasing electric vehicles and providing more charging stations. While highly desirable, the scale of this policy is small, and so EEA/DEP projects it to yield only 0.1 MMTCO<sub>2</sub>e in annual savings by 2020. The original Plan proposed that the percentage sales tax on new automobile purchases vary based on fuel efficiency. Buyers of high-efficiency autos would pay less than the standard 6.25% rate, while those buying gas-guzzlers would pay more than 6.25%. Overall this tax change would be “revenue neutral,” with the higher and lower taxes balancing each other out. The Plan estimated that this would cut emissions 0.2 to 0.4 million MMTCO<sub>2</sub>e by 2020.<sup>5</sup>

Sincerely,

Marc Breslow, Ph.D  
Director of Policy and Research  
Climate XChange  
[mbreslow@climate-xchange.org](mailto:mbreslow@climate-xchange.org)  
(617) 281- 6218



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<sup>4</sup> “Massachusetts Clean Energy and Climate Plan for 2020,” Executive Office of Energy & Environmental Affairs, December 29, 2010, page 61.

<sup>5</sup> Ibid, page 59.

## Low-Cost Sources of Transportation Greenhouse Gas Reduction Potential in Massachusetts – 2020

Mechanism	% of LDV	% of HDV	% of all on-road	mmt CO2e	% of trans- portation
<b>VMT Reduction</b>					
1. Transportation planning - MassDOT Green Transportation Planning (reductions not included in other mechanisms)				0.17	
2. Mass. Healthy Transportation Compact					
3. Smart growth - New development in smart growth patterns	2.10%			0.40	
4. Commuter choice - Maximize telecommuting and other alternatives to single-occupancy vehicle commuting	1.36%			0.26	
5. Nonmotorized – Improve bicycle and pedestrian infrastructure to encourage walk/bike trips	0.92%			0.18	
6. Federal carbon policy - effect on travel	1.10%	1.10%		0.26	
7. Other incentives to reduce non-essential driving & encourage more efficient travel patterns	1.28%			0.25	
<b>Net from VMT Reduction</b>	<b>6.6%</b>	<b>1.1%</b>	<b>6.2%</b>	<b>1.52</b>	<b>5.5%</b>
<b>Vehicle Efficiency</b>					
8. Vehicle efficiency - Every consumer buys a vehicle with best-in-class mileage	10.1%	2.9%		2.07	
9. Ecodriving - Optimize vehicle driving & maintenance practices	5.0%	3.1%		1.10	
10. Federal carbon policy - Vehicle efficiency effect	0%	0%		0.00	
<b>Net from Vehicle Efficiency</b>	<b>14.6%</b>	<b>5.9%</b>	<b>13.8%</b>	<b>3.16</b>	<b>11.4%</b>
<b>Total</b>				<b>4.68</b>	<b>16.9%</b>
<b>MassDOT Green Transportation Planning</b>					
1a. Support for Smart Growth/Efficient Land Use Patterns				0.40	
1b. Support for Non-motorized Travel				0.18	
1c. Major Investment Priorities					
1d. Development Projects					
1e. Construction, Maintenance, and Operations Practices				0.17	
<b>Total</b>				<b>0.75</b>	<b>2.7%</b>
	<b>LDV</b>	<b>HDV</b>	<b>Transport</b>		
<b>Transport CO2e Emissions, 2020 (mmt)</b>	<b>19.2</b>	<b>4.4</b>	<b>27.7</b>		
	69%	16%			
Existing policies case			26.3		





**From:** Edith Buhs

**Sent:** Wednesday, November 16, 2016 3:04:57 PM (UTC-05:00) Eastern Time (US & Canada)

**To:** Strategies, Climate (DEP)

**Subject:** comments on regulations

Dear DEP Staff,

I thank you for your work on behalf of a clean, healthy, enjoyable, livable environment in our Commonwealth. I am a mom, homeowner, worker and climate activist. I volunteer with Mothers Out Front. I urge you to consider that global warming is an enormous threat not only to the Commonwealth, but of course to the entire planet and to continue the leadership role that Massachusetts has taken in the US and MUST continue. Along with states like California and New York we must push what is possible at the state level and show it can be done since we now have little reason for hope of productive action at the federal level. The current work to draft regulations in support of Executive Order 569 is a profound opportunity to act.

We must now move as rapidly as possible to fossil free sources of energy for all uses. We must not invest in any new infrastructure for fossil fuels from this point forward. However, we must also take care of the infrastructure we do have now and that includes taking a vigorous stance against gas leaks. Please do the following:

1. Create local and tailored ways to measure and track gas leaks to be used by the DEP, DPU, utilities, academics and activists. Please follow the expert advice of the Boston University researchers in this matter.
2. Accelerate leak repair with a priority on super emitters. We have seen in other states when utilities are really held accountable and forced to take on the cost of leaks they can indeed rapidly respond and address leaks much more quickly than they say.
3. Do not accept the utilities own reporting of the leaks and their repairs. Their data has been consistently off (in their favor, no surprise) compared to others (Harvard and BU researchers for example) and is not to be trusted.

We must take a bold stand, back it up and make it so. I ask that you do this with all haste and force on behalf of the Commonwealth and the entire planet.

Edith Buhs



## Comments on Proposed Clean Energy Standard

PowerOptions appreciates the opportunity to provide comments to the Massachusetts Department of Environmental Protection (DEP) on its proposed Clean Energy Standard (CES). PowerOptions is a non-profit energy buying consortium providing competitively procured, pre-negotiated optimal pricing for electricity, natural gas, and solar energy to non-profits and public entities under best-in-industry contracts terms and conditions. PowerOptions has close to 500 members in Massachusetts and several members in Connecticut and Rhode Island. Our members include hospitals and healthcare systems, colleges and universities, community and human service agencies, K-12 public and private schools, museums, as well as municipalities and housing authorities, with approximately 200 MWs of peak load and about 1 billion kWhs of energy.

Under our program, we actively price and monitor pricing for energy on a daily basis. We have keen insight into the assumptions suppliers make in their pricing and have assessed the potential impact of the proposed CES on our members. We believe that the CES will have a substantial and direct financial impact on our members. Though this regulation ostensibly only applies to retail electricity sellers, there would undoubtedly be a price impact on end-use customers, and PowerOptions is able to provide a unique perspective of the impacts that would be incurred by those customers.

### **To Be Effective, the CES Must Ensure a Robust Competitive Market**

PowerOptions is supportive of the DEP's efforts to reduce Greenhouse Gas emissions in the state and the region at large, in compliance with the *Kane* decision. PowerOptions is,

however, concerned about circumstances which could undermine the effectiveness of the CES, thus unduly burdening customers with costs without the intended outcomes for emissions reductions. As stipulated in *An Act to Promote Energy Diversity* passed by the legislature this summer, the Massachusetts distribution companies must procure large amounts of clean energy generation and offshore wind in the coming years. As these procurements would likely qualify under the CES, the resources therein would represent a substantial portion of the clean energy needed to meet the CES. This creates two interrelated issues.

First, since the procurements are so large, the entity that ultimately controls the clean energy attributes of these resources will be able to exert substantial market power. With such outsized influence, the holder of these attributes could suppress, or absent a compliance cap, inflate, the prices of not only the CES market, but also the Renewable Portfolio Standard (RPS) market by virtue of the basis of the calculation of the CES targets on the RPS targets. This is anti-competitive and undermines the smooth and fair operation of both markets. Because of this potential market manipulation, PowerOptions requests that the DEP perform an analysis on the impact that the large-scale procurements would have on the competitiveness of CES market. The 2015 CES proposal was designed before *An Act to Promote Energy Diversity* was passed and it is prudent to fully understand the impact that the legislation will have on the anticipated operation of the CES. A DEP-led analysis would be able to determine if the CES will be fundamentally altered by the large-scale procurements and is, therefore, a worthwhile undertaking.

Second, the implementation of a CES has the potential to have a chilling effect on the development of other clean energy resources. This may seem counterintuitive as the CES is designed to incent clean energy development. But the most likely scenario is that a large portion of the CES is satisfied by the procurements done in accordance with *An Act to Promote Energy Diversity*. This means that there will be little in terms of new funding available for other, smaller-scale clean energy resources. This, combined with the price suppression of the RPS market, may act to deter new investment in clean energy. These unintended interactions are concerning and warrant further consideration before moving forward with a CES.

### **Beneficial Design Elements**

If the DEP finds that the above concerns can be avoided in a CES, there are certain design elements that could further guarantee that the benefits of a CES come at a reasonable and fair cost to consumers. Undoubtedly, a CES would raise consumer costs of electricity in an effort to bring the Commonwealth closer to its GWSA targets. While there will be costs to the CES, there are ways to control them and ensure that customers are not excessively burdened. PowerOptions has identified a set of design elements that would mitigate the impact of a CES on Massachusetts customers.

### *Grandfather Existing Contracts*

Many end-use customers have multi-year contracts, with some of those contracts already extending out to potential effective dates for a CES. Customers and retail suppliers entered into these contracts with no anticipation that a CES would be implemented during the contract terms, and it would be unfair to impose such a standard on these contracts. Under



most supply contracts, suppliers have the ability to pass-through to consumers unanticipated costs so a failure to grandfather might not impact suppliers but would most definitely impact customers. Customers enter into contracts for terms of up to five years so as to fix their energy cost exposure and have budget certainty. This is particularly true of PowerOptions members who, as non-profits and government entities, are especially sensitive to unanticipated cost impacts. In situations where the supplier is barred from passing-through such costs, going forward, suppliers will place a premium on pricing until the exact obligation is known, thus unduly increasing costs to customers.

Exempting existing contracts in effect as of the effective date of the new regulations will avoid this outcome. It should be noted that this was done by the Department of Energy Resources (DOER) for the implementation of the solar-carve out when establishing the SREC regime.<sup>1</sup> The same should be done here.

#### *Establish a Predictable Yearly Standard CES Increase*

Regulatory certainty is imperative to control the costs associated with a CES. By establishing a set percentage-based (e.g. 1% per year) increase in the CES standard, suppliers are able to forecast costs predictably into the future and price customers based on that forecast. If, however, the CES standard is set yearly based on non-transparent factors or on a formula that is not predictable year-over-year, suppliers will build a premium into their prices to account for this uncertainty that will, ultimately, increase costs to consumers. There is, of course, valid concern that setting the level of yearly CES increases now reduces the DEP's ability

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<sup>1</sup> 225 CMR 14.09(2)(g) as part of a settlement pursuant to *TransCanada Power Marketing Ltd. v. Bowles*

to respond to information that shows that the regulation is over- or under-achieving the DEP's goals. Thus, there should be program reviews every 3 or 5 years to potentially adjust the standard up or down based on actual performance metrics and cost impacts to ratepayers. This is standard practice in many similar regulatory regimes, including the Regional Greenhouse Gas Initiative, and has proven to be an effective compromise between the desire for regulatory certainty and the need for periodic adjustments.

#### *Allow for Alternative Compliance Payments*

Alternative Compliance Payments (ACPs) essentially set a price ceiling to ensure that customers do not experience overly burdensome cost increases if CES-eligible technologies are unexpectedly costly. The level at which the ACP is set has significant potential to rein in costs associated with a CES. The 2015 CES proposal presented a reasonable ACP rate of 0.5 times the RPS ACP. This continues to be reasonable today, as the CES contemplates incorporating a greater range of technology than the RPS, and the increased competition would theoretically lower the costs necessary to comply with the CES as opposed to the RPS. Experience with other programs has shown that ACPs are invaluable tools for ensuring that regulations do not impose consumer costs far beyond what the regulating entity anticipated.

#### **Conclusion**

PowerOptions requests that the DEP perform an analysis on the impact that large-scale procurements will have on the CES and on renewable development in the state before proceeding. If the DEP proceeds with the CES in its current form after the analysis, there are measures the DEP can take to control costs and protect customers. PowerOptions is looking



forward to engaging with the DEP and other stakeholders on behalf of consumer interests as this process continues.

**From:** tracie burns

**Sent:** Wednesday, November 16, 2016 1:39:41 PM (UTC-05:00) Eastern Time (US & Canada)

**To:** Strategies, Climate (DEP)

**Subject:** Climate Change urgency

Dear Massachusetts Department of Environmental Protection,

The Executive Order is an important and welcome first step. We appreciate it. The Governor has reaffirmed that climate change is a serious threat and that the Administration intends to meet the requirements of the GWSA.

That said, the Executive Order is not enough. Right now, we are **not** on track to hit the 2020 emissions reductions mandated by the GWSA. The Global Warming Solutions Act targets are not aspirational. They are legally required. The Supreme Judicial Court has ruled that the state has an obligation to put regulations in place that ensure we close the gap and achieve compliance by 2020.

We need specific plans and accurate accounting to ensure that the regulations created by the DEP get us to 25% below 1990 levels by 2020.

The current Clean Energy and Climate Plan (CECP) includes many key policies/programs intended to achieve compliance, but we are lagging in meeting 2020 targets and in implementing many of the measures contained in the plan.

Similarly, the new clean energy procurements included in the omnibus bill (hydro and offshore wind) are critical to helping MA transition to clean energy over the coming decades. But because those resources will not come online until after 2020, they will not help us meet the GWSA requirements.

We demand that you rapidly reduce green house gas emissions in the interest of protecting our children's and everyone's future. Gas leaks and new gas infrastructure should be a focus of these reductions. Fix the distribution system! Fix the super emitters! The Department of Environmental Protection should issue regulations that extend beyond 2020 on methane emissions to ensure continued reduction. DEP should also partner with independent researchers to help define "leaks of significant environmental impact." The administration should also factor GWSA impacts into decision making related to siting of new generation facilities and pipelines. Continuing to pursue new gas infrastructure is at odds with our need to comply with the GWSA.

Sincerely,

Tracie Burns



**From:** John Carlton-Foss

**Sent:** Monday, November 21, 2016 5:04:09 PM (UTC-05:00) Eastern Time (US & Canada)

**To:** Strategies, Climate (DEP)

**Subject:** Comments re GWSA Regulations in Development

Comments from John Carlton-Foss, Ph.D.

Strategic Energy Systems Inc.

Climate Action Citizens

Environmental Officer, Weston Democratic Town Committee

It will be enormously important to target goals with safety margins. Not only is this standard practice in engineering, it is also an issue of the welfare of citizens and corporations in the Commonwealth. Only people lacking a medium to long-range view will disagree with this.

There appears to be a deep bias in modeling. The simple version of this is that known emissions per unit of material can be calculated rather precisely, while currently unknown emissions are calculated as zero, and special interests will lobby to minimize any additive error terms. Witness gas distribution companies representing that they have already fixed many more leaks than is credible. This can lead to a very large error and must be corrected.

This also suggests that appropriate means of verification will be very important. My estimation is that the Boston University work presents the gold standard for measurement of gas leaks.

It will be important to develop final language that allows or better, enables, innovative private sector solutions. I will attempt to find the time to edit the language as it emerges over the coming weeks.

I wrote in my notes the following as having been stated: "We [Massachusetts] are responsible for the out of state emissions produced when electricity is generated." I understand this to mean that the emissions from coal-fired electricity generation shall tally against our goals if we are using

that electricity, whether the generation occurs within or outside Massachusetts. A slightly reworded statement should apply to nuclear and gas fired generation. Emissions from gas-fired electricity generation and distribution/storage should tally against our goals if we are using that electricity, whether the generation occurs within or outside Massachusetts. Emissions from the production, inefficient use, and waste management of materials used in nuclear electricity generation should tally against our goals if we are using that electricity, whether the generation occurs within or outside Massachusetts. Perhaps the following would move in the direction of more general language: “We are responsible for the full life cycle cost in tonnes of carbon equivalent for any electricity we use, whatever the fuel, and whatever the venue of generation.”

Anything less than strict parallel construction and implementation of this language will be unfair to the other parties, and is likely to foster excess generation of greenhouse gases.

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John Carlton-Foss, S.M., Ph.D.

Environmental Officer, Weston DTC

Climate Action Citizens

(<https://www.facebook.com/pages/Climate-Action-Citizens-US/552228361510739>)

Videography Outlets: Falmouth CTV, Weston Media, YouTube

NASA simulations have determined that carbon levels above 350 ppm are incompatible with sustaining a planet similar to that on which civilization has developed and to which life on Earth is adapted ([James Hansen](#)). On April 8, 2016, the [Keeling curve](#) exceeded 410 ppm for the first time in recorded history.

**From:** Inge Damm-Luhr

**Sent:** Wednesday, November 16, 2016 3:59:10 PM (UTC-05:00) Eastern Time (US & Canada)

**To:** Strategies, Climate (DEP)

**Subject:**

Dear Massachusetts Department of Environmental Protection,

The Executive Order is an important and welcome first step. We appreciate it. The Governor has reaffirmed that climate change is a serious threat and that the Administration intends to meet the requirements of the GWSA.

That said, the Executive Order is not enough. Right now, we are **not** on track to hit the 2020 emissions reductions mandated by the GWSA. The Global Warming Solutions Act targets are not aspirational. They are legally required. The Supreme Judicial Court has ruled that the state has an obligation to put regulations in place that ensure we close the gap and achieve compliance by 2020.

We need specific plans and accurate accounting to ensure that the regulations created by the DEP get us to 25% below 1990 levels by 2020.

The current Clean Energy and Climate Plan (CECP) includes many key policies/programs intended to achieve compliance, but we are lagging in meeting 2020 targets and in implementing many of the measures contained in the plan.

Similarly, the new clean energy procurements included in the omnibus bill (hydro and offshore wind) are critical to helping MA transition to clean energy over the coming decades. But because those resources will not come online until after 2020, they will not help us meet the GWSA requirements.

We demand that you rapidly reduce green house gas emissions in the interest of protecting our children's and everyone's future. Gas leaks and new gas infrastructure should be a focus of these reductions. Fix the distribution system! Fix the super emitters! The Department of Environmental Protection should issue regulations that extend beyond 2020 on methane emissions to ensure continued reduction. DEP should also partner with independent researchers to help define "leaks of significant environmental impact." The administration should also factor GWSA impacts into decision making related to siting of new generation facilities and pipelines. Continuing to pursue new gas infrastructure is at odds with our need to comply with the GWSA.

Sincerely,

Ingeborg Damm-Luhr

November 16, 2016

Martin Suuberg, Commissioner  
Massachusetts Department of Environmental Protection  
One Winter Street, Second Floor  
Boston, MA 02108

**RE: Proposed GWSA Section 3(d) Regulations for the Transportation Sector and the Natural Gas Distribution System**

Dear Commissioner Suuberg:

In May 2016, the Massachusetts Supreme Judicial Court released a unanimous decision in *Kain vs. Massachusetts Department of Environmental Protection* ordering the Massachusetts Department of Environmental Protection (DEP) to promulgate regulations to ensure the state meets the greenhouse gas emissions targets of the 2008 Global Warming Solutions Act (GWSA). The Court held that DEP must impose volumetric limits on the aggregate greenhouse gas emissions from certain types of sources and that these limits must decline on an annual basis.

The Metropolitan Area Planning Council (MAPC) commends DEP on the thorough stakeholder engagement process on these regulatory changes and the development of regulations that target two important sectors to mitigate emissions throughout the Commonwealth.

MAPC would like to submit the following comments regarding (1) the proposed amendment of 310 CMR 60.05 – GWSA Requirements for the Transportation Sector and the Massachusetts Department of Transportation (MassDOT), and (2) the proposed new regulation 310 CMR 7.73 – Reducing Methane Emissions from the Natural Gas Distribution System, for DEP's consideration.

**Comments on 310 CMR 60.05 – GWSA Requirements for the Transportation Sector and MassDOT**

**Leverage the Massachusetts Vehicle Census to Determine Caps and Track Emissions Impacts**

MAPC supports amending 310 CMR 60.05 to establish declining annual aggregate emissions limits for the transportation sector and MassDOT. MAPC recommends that the Massachusetts Vehicle Census be used as a potential resource for setting targets, designing policy, and tracking progress towards GHG reduction goals.<sup>1</sup> The Massachusetts Vehicle Census is an anonymized dataset of vehicles registered in the state from 2009-2014 and includes annual vehicle miles traveled (VMT), safety inspection records, EPA fuel economy ratings, and census data. The Massachusetts Vehicle Census can serve as a mechanism for setting informed limits for transportation-related emissions and tracking the State's progress in meeting these requirements. These limits could be at the state or Metropolitan Planning Organization (MPO) level through the existing regulation.

In accordance with Executive Order 569, MAPC also recommends that DEP consider using the 3(d) regulatory process to set declining emissions limits on the transportation sector for 2030, 2040, and 2050 to keep pace with future statewide emissions reduction requirements. Executive Order 569 requires that EOEEA set statewide interim emissions limits for 2030 and 2040, by 2020 and 2030 respectively, and specifically calls out the transportation sector to assist in achieving these limits through regional policies.

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<sup>1</sup> <http://data.mapc.org/datasets>

## Improve the Spreadsheet Model and Use Scenario Planning to Inform Project Selection

Currently, MassDOT and the MPOs in Massachusetts use a spreadsheet model developed by DEP to identify annual emissions impacts at the project level. This analysis is used during the project selection processes to inform decision makers (MassDOT officials, MPO members, and Federal partners) about specific projects to be programmed in the Transportation Improvement Program (TIP), which then gets combined with projects MassDOT has prioritized via its Capital Investment Plan (CIP), into the State Transportation Improvement Program (STIP).

This planning process has several drawbacks:

First, the focus at both the regional and statewide level, is on evaluating projects “one off” that are advanced by municipalities, MassDOT District offices, or other stakeholders. To truly use transportation investments as a strategy to decrease emissions, decision makers should use data and modeling to identify investments that will reduce VMT, support sustainable development, and support electric vehicle infrastructure. This can be accomplished through scenario planning, where multiple investment strategies with suites of different transportation projects and policies are modeled and compared against each other.

Second, the spreadsheet model is not sensitive enough to estimate the emissions impact of small projects such as Safe Routes to Schools, bicycle and pedestrian, and ITS transportation management projects. The spreadsheet model also does not provide a truly cumulative understanding of the emissions impacts of transportation investments in the TIP over time—modeled out to 2030 and 2040. While that may be accomplished via the Boston MPO four-step transportation demand model or the MassDOT statewide model, these modeling activities take place after the MPOs have largely made project decisions.

To improve upon the planning and project selection process, DEP should first work with the MPOs and MassDOT to improve upon the spreadsheet model to provide a complete picture of emissions impacts to MassDOT and MPO decision makers, and encourage scenario planning as part of TIP development so that the cumulative impact of transportation projects are evaluated and presented to these same decision makers prior to identifying what goes into the TIP and sending it out for public comment.

## Consider Implementing the Limits through Either a Cap-and-Trade System or Carbon Tax

Building on the success of Massachusetts’ participation in the Regional Greenhouse Gas Initiative, MAPC recommends DEP consider using its regulatory authority to implement a transportation specific cap-and-trade system or carbon tax to facilitate deeper reductions in greenhouse gas emissions. A transportation specific cap-and-trade program could set an annual declining cap on emissions, in line with the requirements of Section 3(d) regulations, and then allocate a corresponding number of tradable emissions permits to transportation sources covered by the program. A carbon tax would curb emissions by raising the price of fossil fuels based on their carbon content. The Transportation and Climate Initiative (TCI) determined that a transportation market-based program or pricing policy, such as an emissions budget program, carbon fee, or mileage-based user fee, would increase the range of emission reductions to 32 to 40 percent in 2030, and could generate proceeds to fund the transportation investments.<sup>2</sup> MAPC recommends that DEP and EOEAA leverage Massachusetts’ participation in the TCI to explore the potential of participation in a regional transportation specific cap-and-trade system.

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<sup>2</sup> TCI is a regional collaboration of 11 Northeast and Mid-Atlantic States and the District of Columbia that seeks to develop the clean energy economy and reduce oil dependence and emissions from the transportation sector.



## Invest in Electric Vehicle Infrastructure and Promote Electric Vehicle Policies and Programs

In 2014, 47% of all GHG emissions in Massachusetts came from the transportation sector, nearly all of that from the use of petroleum products<sup>3</sup>. According to the CECP Update, “In order to achieve the deep reductions required by 2050, it will be necessary to power the transportation sector largely with electricity (p 52).” MAPC recommends that DEP explore how it can encourage investments in electric vehicle infrastructure and the promotion of electric vehicle policies and programs that include:

- Continuing to promote the state's zero emission vehicle (ZEV) target of 300,000 electric vehicles by 2025<sup>4</sup>.
- Promoting the installation of publicly-available fast charging infrastructure, especially along major travel corridors.
- Continuing to offer programs that encourage the purchase and use of electric and/or fuel efficient vehicles.
- Requiring all autonomous vehicles be electric and/or highly fuel efficient.

## Implement Land Use Programs to Mitigate Future Climate Change

MAPC would like to recognize that emissions limits on the transportation network alone will have a minimal impact unless coordinated with policies that invest in electric or alternative fuel vehicles and infrastructure, facilitate sustainable growth in areas where people can get around without relying on an automobile, and encourage people to drive less or switch to carbon-free modes of transportation such as biking and walking.

Even more important than investing in a suite of transportation projects, the way we grow and develop as a Commonwealth will have a tremendous impact on GHG impacts from the transportation sector. Accordingly, DEP should explore how it can use its regulatory authority to influence land use policies such as:

- Incentivizing projects and zoning that support density, housing growth, and mixed land uses within the ten minute walk-shed around MBTA stations.
- Limiting the amount of parking for residential and commercial development within the ten minute walk-shed around MBTA stations.
- Requiring, as part of the Massachusetts Environmental Policy Act (MEPA) process, that new development sites support MBTA transit service, where appropriate.

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<sup>3</sup> U.S. Energy Information Administration, *State Carbon Dioxide Emissions*, [www.eia.gov/environment/emissions/state](http://www.eia.gov/environment/emissions/state).

<sup>4</sup> On October 24, 2013, Massachusetts signed a memorandum with seven states committing to coordinated action to ensure successful implementation of their state zero-emission vehicle (ZEV) programs. Collectively, these states committed to have at least 3.3 million ZEVs operating on their roadways by 2025. Massachusetts' share of the target is 300,000 vehicles, of which approximately 6,500 have been attained.

## Comments on 310 CMR 7.73 – Reducing Methane Emissions from the Natural Gas Distribution System:

### Leverage Existing GSEP Plans to Determine Caps

The Gas System Enhancement Plans (GSEPs) filed by each of the investor-owned gas companies in 2014 and updated annually thereafter, set a path to remove leak-prone pipe within 20 to 25 years. The GSEPs took effect in 2015 and replaced the previous Targeted Infrastructure Replacement Program (TIRF) that were used to remove leak-prone pipe from 2010 to 2014.

MAPC supports the proposed regulation to set aggregate and individual declining emissions caps for gas operators based on the planned rate of repair laid out in each operator's GSEP Plan. MAPC would like to highlight for DEP that the GSEPs have changed over time, and the total emissions reductions slated to be achieved by 2020 based on the most recent 2016 plans are currently lower than when originally proposed in 2014.

MAPC reviewed the GSEPs of the four gas companies with the most leak-prone pipe: National Grid (Boston Gas and Colonial Gas), Columbia Gas, Eversource and Liberty Utilities. Their original GSEPs filed in October 2014 would have cumulatively removed 933 miles of cast-iron pipe and 775 miles of unprotected<sup>5</sup> steel through the year 2020. However, the most recent GSEPs as of October 2016, will cumulatively remove 49 miles and 107 miles less of cast-iron and unprotected steel, respectively, by 2020.<sup>6</sup> The 2016 GSEPs from Eversource and Columbia Gas would remove 99% of the mileage as in the original plans, but the GSEPs for National Grid's Boston Gas and Colonial Gas would remove only 87% and 93% of the original plans, respectively. Liberty Utilities' 2016 plan would remove 89% of the original planned mileage.

At a minimum, MAPC recommends that DEP set a total emissions limit based on the sum total of the plans filed as of 2016, so that no future reduction in mileage occurs. If DEP wanted to achieve more reductions, it could set the total emissions limit based on the sum total of the original plans filed as of 2014. With the exception of National Grid, the GSEPs do not provide guidance for individual year emission caps. Specifically, only National Grid's GSEP lists goals for individual years. All others list total goals for each five year period. As a result, DEP may need to consult with each gas operator as to how it will divide its total emissions reductions between 2018, 2019 and 2020.

MAPC also recommends that DEP consider extending the lifetime of this regulation past 2020 to 2034 (and 2039 for Eversource), to match the timeline of the GSEPs. As highlighted earlier, GSEP goals have been reduced in recent years, and including the full timeline in this regulation will help hold the gas operators to their current plans.

### Include an Adder for Replacement of Pipe with 'Super-Emitting' Leaks

Putting a cap on emissions from the natural gas distribution system is a necessary regulation that will help Massachusetts meet the 2020 emissions reduction target. However, the goal of the Section 3(d) regulations should not be to regulate what was already going to happen, but for the gas operators to achieve greater reductions than they may have without the regulations in place.

One of the challenges with setting more aggressive emissions reductions in this sector, such as using the 2014 GSEP figures, is that it will require additional excavation to municipal roads in the

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<sup>5</sup> i.e. Non-cathodically protected steel

<sup>6</sup> Uses actual replacement numbers reported for 2015, the plan for 2016 filed in 2015, and the plan for 2017-2020 filed in 2016.



short term. MAPC has recently published a report<sup>7</sup> illustrating that there exist many opportunities to improve the coordination of gas main replacement projects with municipal infrastructure projects, which can reduce costs and better protect municipal investments in paving. The gas companies are already scaling up their replacement of gas mains each year through 2020, and requiring additional escalation will strain the coordination practices further and likely result in wasted rate-payer and taxpayer funds and degraded streets. Additionally, the gas companies note in the GSEPs that resource constraints, such as lack of trained contractors, limit their ability to quickly scale up. In this context, MAPC believes that the most effective way to increase emissions reductions by 2020 is to focus on super-emitting leaks.

MAPC recommends that DEP calculate the emissions reductions that would have been achieved using the original 2014 GSEPs and set that as the total goal for the sector and each operator. The difference from the emissions reductions from the 2014 and 2016 GSEPs should be made up by targeting super-emitters.

#### *Measure the Environmental Impact of Super-Emitting Leaks*

310 CMR 7.73 should account for the on-going discussions between DEP and the Department of Public Utilities (DPU) to promulgate regulations that address gas leaks with significant environmental impact. While the content of these regulations will not be known within the set timeline for the GWSA 3(d) regulations, MAPC recommends including a conditional provision in the regulation to address the potential additional decline in the caps pending the results of the parallel regulatory process around the environmental impact of gas leaks.

Ongoing research at Boston University found that 7% of the leaks surveyed in their study contributed to 50% of the emissions.<sup>8</sup> These leaks are commonly referred to as 'Super-Emitting' leaks. The 2012 greenhouse gas inventory reported a total of 0.9 MMTCO<sub>2</sub>e from the natural gas distribution system. MAPC recommends that the proposed regulation include additional required emissions reductions based on the potential impact that gas companies could achieve through targeted replacement of leak-prone pipe with Super-Emitting leaks. If the gas operators targeted repair of super-emitters throughout the state by 2020, DEP could adjust the declining caps to account for the potential reduction of an additional 0.45 MMTCO<sub>2</sub>e. Further, by targeting such a small number of leaks, the state could access these additional emissions reductions with minimal disruption and impact to municipalities.

One barrier to implementing this practices is that, currently, emissions in this sector are calculated based on measurements of the total mileage of leak-prone pipe and an applied emissions factor specific to the type of pipe. This process does not provide specific recognition of the emissions reduced by repairing super-emitting leaks or replacing pipes with super-emitting leaks on them. MAPC strongly recommends that the emissions methodology be adjusted to allow gas companies to claim additional emissions reductions if they fix super-emitting leaks.

#### *Use Leak Extent as a Proxy for Environmental Impact*

A second barrier to using super-emitters for emissions reduction is the difficulty in identifying and measuring the leaks. The process used to measure the volume of gas leaking from a leak is time consuming and not cost-effective to perform on the over 14,000 leaks on the system. MAPC suggests that leak extent could be used as a proxy measurement in the interim to determine which leaks the gas operators should target to achieve the greatest reduction in emissions in the shortest

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<sup>7</sup> Fixing Our Pipes: Coordinating Natural Gas Main Replacement between Local Governments & Gas Companies, 2016, available at <http://fixourpipes.org>

<sup>8</sup> Margaret F. Hendrick et al. Fugitive methane emissions from leak-prone natural gas distribution infrastructure in urban environments, Environmental Pollution (2016). DOI: 10.1016/j.envpol.2016.01.094



amount of time. Leak extent is a measurement of the area of soil saturated with some percentage of natural gas. The leak extent is determined for every leak investigation currently. MAPC's recently released study<sup>9</sup> included analysis of independent gas leak surveys and found that only 7% of the leaks identified accounted for 47% of the leak extent area. The similarity of this ratio to the Boston University findings on leak volume suggest that leaks with the largest extents may be a suitable proxy for leaks emitting the largest volumes. Using leak extent to quickly identify leaks with significant environmental impact could provide a cost-effective strategy for gas operators to target the repair of these leaks and increase the potential reduction from the gas distribution system by 2020.

#### Recommend Promulgation of DPU Regulations to Improve Municipal & Gas Company Coordination

MAPC would also like to provide additional comments on two potential non-3(d) regulations that DEP should consider recommending to DPU during on-going conversations on the environmental impact of gas leaks, to increase the likelihood that gas operators will meet the declining cap requirements laid in 310 CMR 7.73. Our study highlighted ongoing issues with coordination, data sharing, and communication between municipalities and gas operators that all hinder the pipe replacement schedule outlined in the GSEPs. The GSEPs demonstrate a significant ramp up in repair work from 2014 to 2034 (approximately a 60% increase in annual miles replaced) for gas operators in Massachusetts, and without addressing existing coordination issues potential for delay is greater.

#### *Require Each Gas Operator Implement a Paving Cost Recovery Policy*

One key focus of our study is how municipalities and gas companies can synchronize pipe replacement with municipal road work to save money and expedite work. To incentivize coordination, the DPU should require each gas operator to have a program or policy in place to enable cost recovery for the paving costs eliminated when work is synchronized (i.e. when the gas operator does not need to re-pave the road because they complete the work prior to the municipality's planned paving project). The regulation should (1) require a 50/50 split of these cost savings with the municipalities and (2) mandate reinvestment of the cost savings claimed by the gas operators into expediting the repair of gas leaks and replacement of leak prone pipe. Columbia Gas successfully implemented a bi-lateral agreement with the city of Lawrence that could be used as a model policy for other gas operators.

#### *Establish a Contact Database for Community Contacts with Each Gas Operator*

Another critical barrier to coordination is a lack of clarity in the appropriate points of contact at the gas company for municipalities. To facilitate successful implementation of the GSEPs and ensure the emissions caps are met, the DPU should establish a regulation that requires each gas operator to submit contact information for community liaisons and update the information on an annual or bi-annual basis.

Thank you for the opportunity to provide comment on the proposed regulations and for DEP's consideration of these recommendations, which MAPC believes will assist in meeting the 2020 emissions target and set the Commonwealth on a strong path to achieve the 2050 target.

Sincerely,



Rebecca Davis  
Deputy Director, MAPC

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<sup>9</sup> Ibid

cc: Matthew Beaton, Secretary, Executive Office of Energy and Environmental Affairs  
Stephanie Pollack, Commissioner, Massachusetts Department of Transportation  
Angela M. O'Connor, Chairman, Massachusetts Department of Public Utilities



50 ROWES WHARF | BOSTON, MA 02110 | P:617-330-7000  
800 CONNECTICUT AVE. NW | WASHINGTON, DC 20006 | P:202-794-6300  
99 WILLOW STREET | YARMOUTHPORT, MA 02675 | P:508-362-6262

John A. DeTore  
Direct Dial: 617-330-7144  
Direct Fax: 617-330-7550  
E-mail: JDeTore@rubinrudman.com  
Return Address: Boston

November 21, 2016

Mr. Martin Suuberg  
Commissioner  
Massachusetts Department of Environmental Protection  
One Winter Street  
Boston, MA 02108

Re: Comments of Footprint Power Salem Harbor Development LP; and NRG Canal 3 Development LLC on Massachusetts Department of Environmental Protection Stakeholder Discussion Draft, dated November 7, 2016.

Dear Commissioner Suuberg:

**I. INTRODUCTION**

On November 7, 2016, the Massachusetts Department of Environmental Protection (“MassDEP”) provided a stakeholder discussion draft (“Draft”) to solicit input on the prospective development of regulations to implement Section 3(d) of the Global Warming Solutions Act (“GWSA”). Footprint Power Salem Harbor Development LP (“Footprint Power”) and NRG Canal 3 Development LLC (“Canal 3”) (collectively “Joint Commenters”) appreciate the opportunity to file comments on this critical issue. The Joint Commenters are the developers of two of the so-called “New Facilities” referenced in the Draft and these comments address their proposed treatment in the Draft.

**A. Summary of Comments**

The Joint Commenters strongly support the goals of the GWSA. In fact, the construction and operation of the Joint Commenters' facilities are essential to the Commonwealth's ability to achieve the Greenhouse Gas reduction goals of the GWSA. The New Facility Aggregate GHG Emissions Cap, however, is woefully inadequate and will so severely limit the operation of the New Facilities as to render them uneconomic and unable to contribute to the necessary reductions in GHG emissions. The unavailability of the New Facilities may have an adverse impact on the reliability of electric supply, will produce the perverse result of increasing Statewide Greenhouse Gas Emissions and will increase electric costs that will flow to the Commonwealth's consumers.

**B. Inadequacy of the New Facility Aggregate GHG Emissions Cap**

All of the New Facilities have spent millions of dollars in permitting and development costs. In addition, the Footprint Power Facility is currently spending hundreds of millions of dollars in construction costs to reach its in-service date in 2017. These investments in new, more efficient power plants were made in reliance on existing laws and energy markets that were designed to provide a fair opportunity for these new facilities to compete on an equal basis for the opportunity to operate and earn energy revenues. Until May of 2016, the position of the Commonwealth, and MassDEP, was that MassDEP was in full compliance with the GWSA. Moreover, the Settlement Agreement between Footprint Power and the Conservation Law Foundation ("CLF Settlement") provided a template of what might be considered acceptable caps on CO<sub>2</sub> emissions to meet the goals of the GWSA. Just recently, MassDEP proposed a declining CO<sub>2</sub> emissions cap in the Draft Air Permit for another new facility, West Medway. MassDEP is expected to propose a similar declining cap for the Canal 3 Facility.

The potential New Facility Aggregate Cap is a jarring, and drastic, departure from this precedent. The New Facility Aggregate Cap is only one million metric tons. That cap will then decrease by 2.5% until 2050.<sup>1</sup> By any reasonable measure, a one million metric tons-per-year limit will not support viable economic operation of the New Facilities. Footprint Power will be the first plant to come on line in June of 2017. As mentioned above, the CLF Settlement establishes a declining CO<sub>2</sub> emissions cap. The CLF Settlement annual cap limit in 2018-2020 is 2,279,530 metric tons - a value that is 2.3 times the one million metric tons in the Draft which is intended to establish a cap on the CO<sub>2</sub> emissions of all three of the New Facilities. The CLF Settlement states that this cap, which includes the 2018 - 2020 annual value of 2.3 million metric tons of CO<sub>2</sub>, “represents the type of threshold conditions that may permit new fossil fuel infrastructure, including generating facilities, to demonstrate compliance with the GWSA, including the GWSA’s 2050 mandate.”

Accordingly, even if the entire one million metric ton limit was allocated to Footprint Power, it would be limited to only 43% of the operation contemplated in the CLF Settlement. Because Footprint Power will be among the most efficient in New England, it is likely to be dispatched frequently by ISO New England (“ISO-NE”). A one million metric ton cap would drastically limit the operation of Footprint Power, which the CLF Settlement describes as an “efficient and flexible generation solution capable of supplanting less efficient, more highly polluting facilities.” In addition, the Energy Facilities Siting Board has concluded that both the Footprint Power Facility and the West Medway Facility will displace older, more highly emitting

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<sup>1</sup> The prospect that New Facilities will be able to procure significant Over Compliance Credits (“OCC”) is simply not realistic. The proposed 2018 aggregate cap for existing units will permit the generation of approximately 17.7 million megawatt hours (MWH). In 2015, we calculate that these existing units produced approximately 24.2 MWHs. This means that in 2018, electric generation from these plants will be reduced by 27.7%.from 2015 levels. Electric Load is expected to increase over the period 2015 - 2018, hence the accumulation of OCC by existing generating units seems far-fetched. Moreover, it seems incongruous to require more efficient New Facilities that have lower CO<sub>2</sub> emission rates to acquire OCCs from less efficient facilities.

units and that such displacement would result in reduced emissions even after accounting for the units' own emissions.<sup>2</sup>

Once Footprint Power is dispatched by ISO-NE up to about a 40% capacity factor (far less than expected given its low heat rate), it will consume the entire one million metric ton New Facility Aggregate GHG Emissions Cap. That leaves no emissions allowance for the Canal 3 Facility or any other new facility, including West Medway, for which DEP has already issued a draft air permit.<sup>3</sup> Preventing both the West Medway and Canal 3 units from any operation is palpably unfair to the developers and, more important, totally contrary to the public interest and the goals of the GWSA.<sup>4</sup>

Moreover, MassDEP has recently issued a Comprehensive Air Plan Approval ("Draft Air Permit") for the proposed 200 MW West Medway Facility which includes a declining cap for CO<sub>2</sub> emissions with a 2018 limit of 505,000 metric tons. MassDEP explicitly states in the Draft Air Permit that this emissions cap is established to "help the Commonwealth achieve the mandated limits to reduce GHG emissions by 25% from the 1990 emissions level by the year 2020 and by 80% from the 1990 emissions level by the year 2050..." Assuming that MassDEP mandates a proportional CO<sub>2</sub> cap on the 350 MW Canal 3 Facility, the limit in the first year of operation (2019) of Canal 3 would be approximately 810,000 metric tons. Adding the MassDEP 2019 Canal 3 cap of 810,000 metric tons to the 2019 West Medway Cap of 492,375 metric tons

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<sup>2</sup> See Footprint Power, EFSB 12-2 at Pages 31-32 and Exelon West Medway, EFSB 15-01 at Pages 61-65. The Canal 3 Siting Board Petition is pending before that agency.

<sup>3</sup> The Joint Commenters note that the draft regulations also include a provision (310 CMR 7.77(4)(e)(2)) that sets the long range CO<sub>2</sub> emissions cap on New Facilities at 92.5 percent of the average of their first two years of actual operation. It is of significant concern that this average will not be representative of the most efficient long-term use of the New Facilities for a multitude of reasons, including annual variations in ambient temperatures, fuel availability, existing unit forced outage rates and the typical "break in" period associated with the start-up of all new projects.

<sup>4</sup> As discussed below, the high efficiency of the New Facilities will produce lower GHG emissions and lower electric costs to consumers.

(second year of operation) yields a total of about 1.3 million metric tons which is in excess of the one million metric ton New Facility Aggregate GHG Emissions Cap and leaves no allocation for Footprint Power.

Aggregating the emissions limits agreed to by CLF for Footprint Power and established by MassDEP for West Medway and, presumably for Canal 3<sup>5</sup>, yields a total emissions limit in 2019 of approximately 3.6 million metric tons. Both the CLF Settlement and the MassDEP West Medway Draft Air Permit explicitly state that CO<sub>2</sub> limitations of that magnitude on those particular generating plants are consistent with the achievement of both the 2020 and 2050 goals of the GWSA. In light of this, it is difficult to understand why MassDEP would now consider imposing a New Facility Aggregate GHG Emissions Cap that is only about one quarter of that amount for these same three facilities.

### **C. Adverse Impacts of the New Facility Aggregate GHG Emissions Cap**

Regardless of how the one million metric ton New Facility Aggregate GHG Emissions Cap is allocated among the three New Facilities, the inevitable result would be that their operations would be so curtailed as to threaten their economic viability and prevent them from contributing to the GHG emission reductions that all stakeholders seek. The financial impact on the developers would be devastating and, in some cases, may well prevent the construction of the facilities. The adverse impact on the public interest, and in particular, the achievement of the goals of the GWSA, would be equally harmful. As discussed in more detail below, the Footprint Power, West Medway and Canal 3 facilities are highly efficient generating plants that will make important contributions to reliability of electric service, produce net reductions in carbon

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<sup>5</sup> This assumes MassDEP establishes a proportional declining cap similar to West Medway in the Canal 3 Air Permit. Specifically, the Canal 3 declining CO<sub>2</sub> emissions limit would be based on a 350 MW generating facility.

emissions, support the integration of renewable resources and provide lower cost energy to the regional grid.

The starting point of the analysis is the fact that Massachusetts is part of a regional, interconnected electricity system operated by ISO-NE. From an electricity perspective, Massachusetts does not operate as a separate entity independent from the rest of New England. Demand for electricity in Massachusetts is not met solely by plants located within the boundary of the Commonwealth. Rather, ISO-NE operates a regional electric dispatch system whereby electricity demand throughout New England, including Massachusetts, is met by the entire fleet of generation resources throughout the region. ISO-NE operates this regional dispatch system on a least-cost basis. That is, as electric demand in New England increases, ISO-NE selects the least-cost generating facility available in New England to meet that demand.<sup>6</sup>

Because of the manner in which ISO-NE operates its least-cost dispatch, the least cost unit is usually the unit with the lowest CO<sub>2</sub> emissions. ISO-NE dispatches units based on their marginal operating costs. This means that renewable resources, like wind and solar, are dispatched first because they have virtually no operating costs. For fossil units using the same fuel, the dispatch is based primarily on the heat rate of the unit. The lower the heat rate, the lower the cost and the lower the CO<sub>2</sub> emissions. The New Facilities have very low heat rates for units in their class and would be some of the first fossil units dispatched by ISO-NE, depending upon whether base load or peaking energy was needed. As the EFSB has already determined with respect to Footprint Power and West Medway, the operation of these facilities will themselves result in the overall net reduction of GHG emissions. Limiting their operation in any

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<sup>6</sup> Although the ISO-NE transmission system is very robust, there are some transmission constraints, especially running from Northern New England to Southern New England. As a practical matter, this means that generating facilities in Connecticut and Rhode Island are somewhat more accessible to Massachusetts.



way would have the effect of increasing net GHG emissions – exactly the opposite of the result required by the GWSA and sought by all stakeholders.

The Draft would limit existing units in Massachusetts to generating approximately 17.7 million MWHs in 2018 as compared to 2015 wherein we estimate that these units produced approximately 24.2 million MWHs to help meet electric demand in that year. The Draft imposes this severe limit notwithstanding the fact that the electric sector has already achieved a 25% reduction from 1990 levels. The New Facilities are limited to one million metric tons instead of the 3.6 million metric tons that are included in the CLF Settlement and MassDEP Air Permits. We examine below the impact of these reductions, especially those imposed on the New Facilities, on reliability of supply, carbon emissions and cost to consumers.

#### **D. Reliability of Electric Supply**

The Draft would limit all generating units in Massachusetts, including the New Facilities, to a total of 18.7 million MWHs in 2018. Based on an initial analysis, that is a reduction of 22.7% from the MWHs generated in 2015 by the existing units only. This means that the amount of electricity that could legally be generated by all Massachusetts generating facilities in 2018 pursuant to the Aggregate GHG Emissions Cap is 22.7% less than what was generated in 2015. However, electricity demand in New England in 2018 is expected to be somewhat higher than it was in 2015. This means that ISO-NE will have to fill this gap by dispatching less efficient generating units in other New England states. It is not at all clear that ISO-NE will be able to do that successfully. For example, on September 26, 2016, Gordon van Welie, President and CEO of ISO-NE, published a presentation entitled: *The Transformation of the New England Power System: Infrastructure Needs and Market Implications* in which he stated that New England electricity operating system is “precarious” during the winter time and beyond 2019

(when the Aggregate GHG Emissions Cap will be even lower), “it may become unsustainable during extreme cold conditions.”

In addition, Massachusetts is not the only state that is committed to reducing CO<sub>2</sub> emissions. The State of Connecticut has enacted its own version of the GWSA which calls for a 10% reduction below 1990 levels by 2020 and an 80% reduction by 2050.<sup>7</sup> Rhode Island has a similar statute which calls for a 10% reduction from 1990 levels by 2020 and an 85% reduction by 2050.<sup>8</sup> Massachusetts already relies on significant amounts of electricity from these states to meet its electric needs.<sup>9</sup> In light of their own legal mandates to reduce CO<sub>2</sub> emissions, it does not seem prudent to expect that either Connecticut or Rhode Island would be willing to increase electric generation from plants within their boundary to enable Massachusetts to meet its GWSA goals at the expense of their own similar environmental objectives.

#### **E. Statewide Greenhouse Gas Emissions**

Even assuming that electric generation from other New England states will fill the gap created by the Aggregate GHG Emissions Cap, that generation will necessarily be less efficient (and more carbon polluting) than the Massachusetts generating units it will replace, especially in the case of the New Facilities, which will be among the most efficient units in the system.<sup>10</sup> The one million metric ton New Facility Aggregate GHG Emissions Cap would substantially limit the dispatch of the New Facilities by ISO-NE. If the New Facilities are not available for dispatch solely because of the one million metric ton New Facility Aggregate GHG Emissions Cap, ISO-

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<sup>7</sup> Connecticut Public Act No-08-98.

<sup>8</sup> The Resilient Rhode Island Act of 2014.

<sup>9</sup> In 2014, Massachusetts consumers used 44% more electricity than was generated within the Commonwealth.

<sup>10</sup> To the extent that new renewable resources come on line, they will be dispatched ahead of any fossil units in the Commonwealth, including the New Facilities, consistent with NE-ISO’s least-cost dispatch.

NE will have to dispatch in their place less efficient generating units outside the Commonwealth. This will result in higher GHG emissions.<sup>11</sup>

Although these CO<sub>2</sub> emissions will be generated by smokestacks outside the Commonwealth, the GWSA is clear that these emissions must be included in the calculation of the Statewide Greenhouse Gas Emissions Limit.<sup>12</sup> The definition of Statewide Greenhouse Gas Emissions in the GWSA includes “all emissions of greenhouse gases from the generation of electricity delivered to and consumed in the commonwealth, accounting for transmission and distribution line losses, whether the electricity is generated in the commonwealth or imported.” Moreover, Section 3(c) of the GWSA mandates that emissions levels and limits for the electric sector be “based on consumption and purchases of electricity from the regional electric grid...” Thus, limiting the operation of the New Facilities so drastically (as the one million metric ton New Facility Aggregate GHG Emissions Cap does) will inevitably result in increased purchases from less efficient units from the regional grid that will be delivered to and consumed in the Commonwealth. These purchases from the regional grid will produce higher levels of Statewide Greenhouse Gas Emissions-a result directly contrary to the GWSA.

#### **F. Electric Costs to Consumers**

As discussed above, the one million metric ton New Facility Aggregate GHG Emissions Cap would greatly limit the operation of the New Facilities. This means that ISO-NE would have to dispatch less efficient units to meet electric demand in the Commonwealth (assuming such units are available). This inefficient and uneconomic dispatch will not only increase Statewide Greenhouse Gas Emissions, it will also increase the cost of electricity to the consumer.

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<sup>11</sup> Because the electricity generated outside the Commonwealth must be transported a further distance, transmission line losses will further decrease efficiency and increase carbon emissions.

<sup>12</sup> These higher emissions might also have an effect on efforts of other states like Connecticut and Rhode Island to meet their statutory obligations.

Again, ISO-NE dispatch is based on least cost principles and the least expensive plants to operate are dispatched first. As a result, every megawatt hour of electricity that must be generated by a less efficient, and more costly, unit because the operation of the New Facilities is constrained by the one million metric ton New Facility Aggregate GHG Emissions Cap will be more expensive to produce and will increase the electricity bills which all consumers pay.

## **II. CONCLUSION**

The Joint Commenters respectfully submit that the case against a one million metric ton New Facility Aggregate GHG Cap is overwhelming. This cap could threaten the reliability of the electric supply and will, indisputably, increase Statewide Greenhouse Gas Emissions and will raise the price of electricity to consumers. Moreover, a New Facility Aggregate GHG Cap of only one million metric tons is totally inconsistent with the CO<sub>2</sub> caps in the CLF Settlement, the West Medway Draft Permit and , presumably, the Canal 3 Air Permit, which total 3.6 million metric tons in 2019. Language in both the CLF Settlement and the West Medway Air Permit explicitly state that caps of that magnitude are consistent with achieving the goals of the GWSA in 2020 and 2050.

The Joint Commenters urge MassDEP to increase substantially the Aggregate GHG Emissions Cap. At a minimum, that increase should include an increase in the New Facility Aggregate GHG Emissions Cap to 3.6 million metric tons. Such an increase will permit the New Facilities to contribute to the net reduction of regional GHG emissions as the EFSB has recognized they will do if allowed to operate consistent with the ISO-NE dispatch. A better solution, however, is for the Commonwealth to consider net GHG impacts in its permitting process – as it has in the case of the New Facilities, and not impose a cap on them at all when

those permitting proceedings determine that the facilities' operation will result in a net reduction in GHG emissions.

Respectfully submitted,

On behalf of

FOOTPRINT POWER LLC, and  
NRG CANAL 3 DEVELOPMENT LLC

A handwritten signature in black ink, appearing to read "John A. DeTore". The signature is written in a cursive, flowing style.

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John A. DeTore  
Rubin and Rudman LLP  
Telephone: 617-330-7023  
[jdetore@rubinrudman.com](mailto:jdetore@rubinrudman.com)

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From: nancy dimattio

Sent: Tuesday, November 1, 2016 12:50:20 PM (UTC-05:00) Eastern Time (US & Canada)

To: Strategies, Climate (DEP)

Subject: GHG Section 3d Comments

Dear Fellow Human Beings,

I know that it may seem over the top to address you this way. I don't know how else to begin to talk about the devastation we are wreaking upon ourselves each and every day with our continued use of fossil fuels. We are in this together. Every toxic breath, every dying coral reef, every polluted drop of water and every sick child - in this together. And together we must turn the tide of this destruction by stopping our use of and support for fossil fuels.

Thank you for understanding the urgency of this situation and for acting now in every way to decrease CO2 and other toxic emissions.

Sincerely,

Nancy DiMattio

Amherst, MA 01002

Mothers Out Front

## **Comments on Stakeholder Drafts of Greenhouse Gas Emissions Reductions from Electricity Generating Facilities and Clean Energy Standard**

The New England Power Generators Association (NEPGA)<sup>1</sup> appreciates the opportunity to provide these initial comments to the Massachusetts Department of Environmental Protection (DEP) on the stakeholder discussion drafts posted on November 7 for “Reducing Greenhouse Gas (GHG) Emissions from Electricity Generating Facilities Program” and a “Clean Energy Standard” (CES). NEPGA recognizes that pursuant to the Governor’s direction,<sup>2</sup> DEP is setting a process with multiple opportunities to provide input and feedback to institute sector-specific regulations to reduce GHG emissions pursuant to direction under the Global Warming Solutions Act (GWSA). NEPGA is committed to working with DEP to meet the emissions reduction mandates while maintaining competitive electricity costs and ensuring continued reliability. Within that framework, NEPGA believes that the best way to meet state policies for the benefit of consumers is to provide a truly competitive market that does not discriminate between resource types or resource vintage.

NEPGA is the trade association representing competitive power generators in New England. NEPGA’s member companies represent approximately 26,000 megawatts, or roughly 80% of the installed capacity in New England and approximately 83% of the covered emissions in the proposed DEP regulations. NEPGA’s mission is to support competitive wholesale electricity markets in New England. NEPGA believes that

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<sup>1</sup> The comments expressed herein represent those of NEPGA as an organization, but not necessarily those of any particular member.

<sup>2</sup> Executive Order 569, “Establishing an Integrated Climate Change Strategy for the Commonwealth”



open markets guided by stable public policies are the best means to provide reliable and competitively-priced electricity for consumers. A sensible, market-based approach furthers economic development, jobs and balanced environmental policy for the region.

Understanding that both the proposed GHG power sector emission cap and Clean Energy Standard are early in their development, we respectfully offer the following key points for the DEP to consider as the agency proceeds with the rulemaking process:

1. Massachusetts has achieved economy-wide GHG emissions reductions of 24% below 1990 levels, before a single regulation has been put into place. That is only 1% away from the 25% reductions called for by 2020. In light of these numbers, DEP should take a more deliberate approach in power generator regulations and substantially increase any emissions cap from what was proposed.
2. The Massachusetts power sector has already reduced GHG emissions 60% below 1990 levels, well beyond levels asked for and achieved by other emitting sectors and DEP should include these equity considerations in its approach to implementing the GWSA provisions. DEP's focus should be on increasing reductions from these other sectors, such as transportation, given the leadership that has already been shown by the power sector.
3. Imposing a *state-specific* emissions cap on generators operating within a competitive *regional* power market is bad environmental and energy policy that will likely result in the unintended consequences of shifting generation out of state without reducing regional GHG emissions, jeopardizing the ISO-NE electricity system reliability, and increasing costs to Massachusetts consumers.

4. Any new policy capping GHG emissions from the state power sector should include compliance flexibility mechanisms that allow generators to effectively manage the competing interests of delivering energy and reducing GHG emissions. This might include an appropriately designed reliability exemption, emergency fund, banking and borrowing protocol, or some other approach. No environmental mandate should be imposed that could have a direct threat to regional power system reliability.
5. Existing and new sources must be treated equitably under new carbon policy.
6. If the DEP proceeds with CES development it should create an emission standard-based policy and then allow any generation source, new or existing, that meets that standard to qualify for participation.

We elaborate on these points in the text that follows.

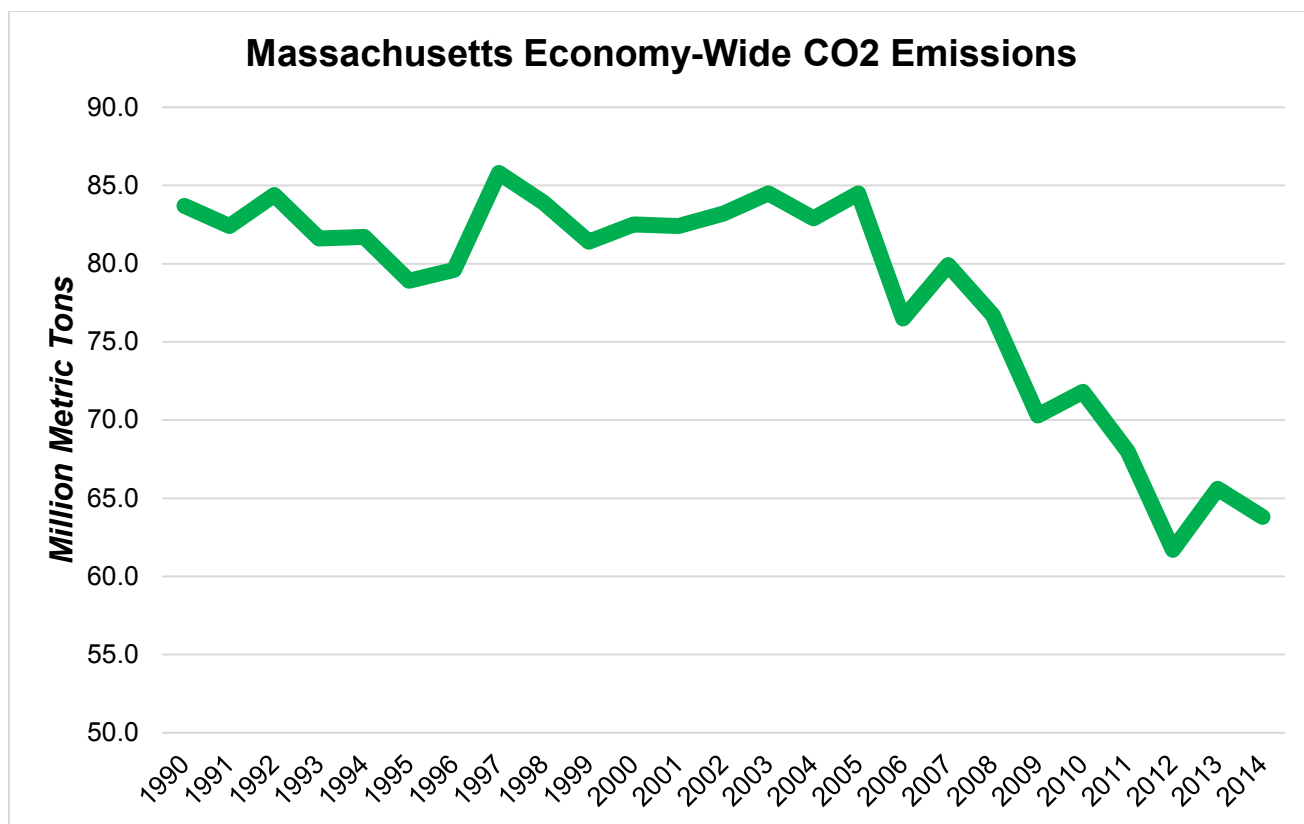
## **Emissions Reductions from Electricity Generating Facilities**

### *Historical and Actual Generation Emissions*

Just four days before DEP's stakeholder meeting on Emitting Electricity Generators, the U.S. Energy Information Administration (EIA) released updated 2014 CO<sub>2</sub> emissions data showing that Massachusetts is on the cusp of its 2020 mandate. Massachusetts has achieved economy-wide carbon dioxide (CO<sub>2</sub>) emissions reductions of 24% since 1990,<sup>3</sup> now only 1% off the 2020 mandate of 25% below 1990 emissions.

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<sup>3</sup> EIA, State Carbon Dioxide Emissions, Released November 3, 2016. Grand total carbon dioxide emissions in Massachusetts 1990 were 83.7 million metric tons and 63.8 million metric tons in 2014. <http://www.eia.gov/environment/emissions/state/>

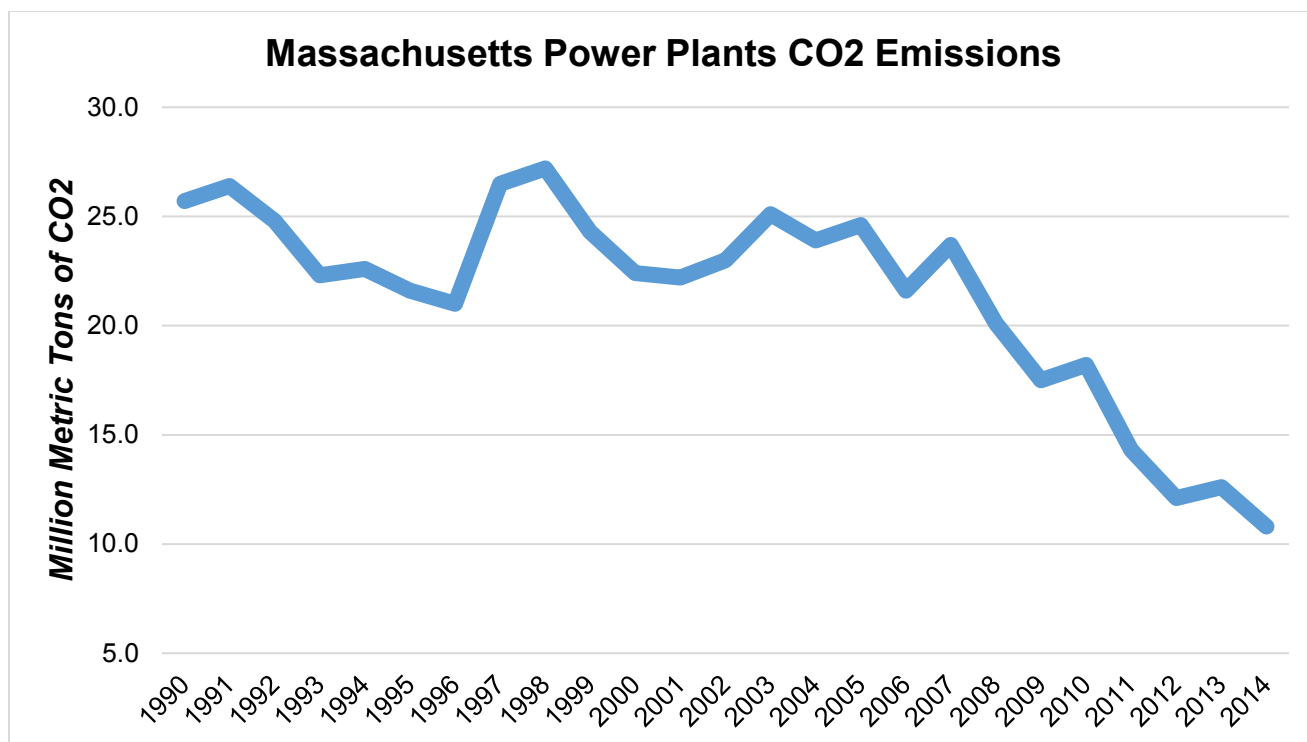


Massachusetts should celebrate this achievement and now take the appropriate time it affords to fully consider what long-term policies may be necessary to meet the subsequent mandate of 2050 emissions 80% below 1990 levels. The new information should also cause DEP to substantially revise the proposed regulations. In fact, NEPGA asserts that given the dramatic reductions realized, no material additional cuts in CO2 emissions from the power generation sector are necessary by 2020. The incremental 1% reduction, or approximately 0.84 million metric tons (MMT), should be achievable with modest emphasis on transportation or others lagging in their emission reductions.

The Massachusetts success story, after all, has been driven primarily by the competitive generation sector, which has cut CO2 emissions 60% below 1990 levels.<sup>4</sup>

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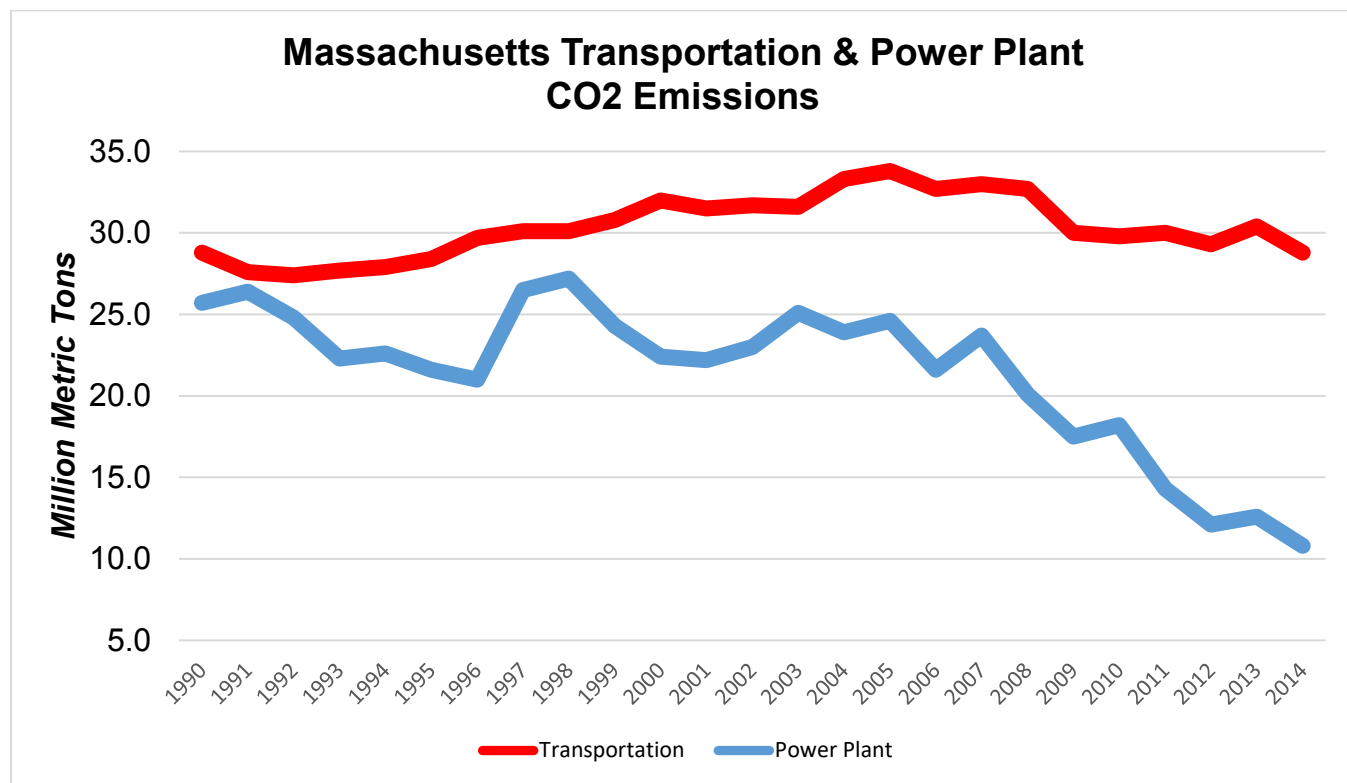
<sup>4</sup> U.S. EIA, State Carbon Dioxide Emissions. CO2 emissions from the electric power sector in 1990 were 25.7 million metric tons and reduced to 10.8 million metric tons in 2014.



Much of this decline was driven by the increased use of natural gas for power generation and a move away from coal and oil. What is also notable, however, is that the largest drops came upon the advent of restructuring of the electricity industry. Following the passage of the Massachusetts Restructuring Act in 1997, emissions peaked in 1998 at 27.2 MMT. Once competition was introduced in the power generation market, power plant owners brought tremendous efficiencies to the industry. Since 1999, the efficiency (measured in heat rate) for power plants increased by 22%, meaning that the electricity output that used to take four plants to produce, today takes only three. This not only translates into dramatically lower emissions from the producing units, but also results in the need for fewer plants.

NEPGA recognizes that with the impending retirement of the Pilgrim Nuclear Power Station, some rise in emissions should be expected in New England and, to a lesser extent, in the Commonwealth. However, it must also be noted that many of those

emissions will be offset, in part, by the retirement of other facilities, such as the Brayton Point Power Station in May 2017. The electricity sector has dramatically out-performed every other sector in cutting CO2 emissions and now represents only a third of the emissions from the transportation sector.<sup>5</sup>



DEP should now shift its focus to sectors, like transportation, that have not shown a similar emissions trajectory as electricity. NEPGA is compelled to highlight that the emissions regulations being proposed for emitting generators would have a larger impact on commercial operations of those affected resources, than any of the proposed regulations in other sectors. Put another way, despite having already cut CO2 emissions by 60%, a deeper impact will be felt in the electricity sector from the

<sup>5</sup> EIA, State Carbon Dioxide Emissions. Transportation sector CO2 emissions in Massachusetts in 2014 were 28.8 million metric tons versus 10.8 million metric tons in electricity generation.

proposed regulations than the regulations applicable to other covered sectors. That simply doesn't make sense.

Maintaining the current path laid out in the stakeholder draft will have severe impacts for the Commonwealth's power plant owners and consumers, without the actual need and will also lead to the perverse outcome of not cutting regional emissions. That is because the proposed regulations will constrain output from Massachusetts-based power plants, inevitably leading to increased production – and therefore, emissions – from out-of-state resources. The Commonwealth is part of a New England-wide electricity market that is dispatched as a region and not on a state-specific basis. Therefore, any reduced generation in Massachusetts will simply shift power production requirements to resources located in other states in the region and will generally not lead to any actual net emissions reductions. Instead, it will cause increased costs for Massachusetts consumers as otherwise economic power generation resources located in the Commonwealth will no longer be able to be dispatched as frequently because of onerous emissions caps; instead more expensive generation out-of-state will be used, and paid for, by consumers. These out-of-state generators would presumably also have a higher heat-rate, therefore lower efficiency and higher emissions, or they would have been dispatched before their Massachusetts-based competitors. This is bad energy policy and bad environmental policy.

#### *Reliability and Market Impacts*

The unit-specific emissions caps proposed in 310 CMR 7.77(4)(b) Table A will have an immediate negative impact on the continued economic operation of those facilities with significant potential impacts on reliability. Power generation resources in

Massachusetts are likely to be in the untenable position of violating emissions regulations set by DEP or putting the electricity grid in peril by not being able to perform should ISO New England need them. This situation is wholly avoidable.

Under the structure proposed by DEP, specific resources will have a set emissions cap with the potential for units that over-comply (i.e. generate CO<sub>2</sub> emissions below their prescribed limits) in any given year to then sell or transfer an over-compliance credit (OCC) to resources that exceed their caps. This is a simple cap-and-trade model with which the electricity industry is generally familiar and comfortable. However, there are serious practical challenges to the regime proposed here.

In particular, because this mechanism is only for Massachusetts power plants there will be a small, illiquid pool from which OCCs may be bought and sold. As listed by DEP, there are only 22 existing facilities that will be participating. Under the proposed regulations, each facility is limited to a hard cap that, at first blush, appears to be quite low. Based on the small pool, it is therefore unlikely that credits will be traded at a volume commensurate with other, regional cap-and-trade programs that have been successful. This general concern is further compounded by timing issues that will make the trading of credits even more difficult, if not impossible.

The electricity market is distinguished by being unpredictable and subject to an almost infinite amount of variables based on electricity demand, weather and the occurrence of contingencies affecting both power generation and fuel supplies. Because of the unpredictable nature of electricity and the illiquid market for OCCs, individual resources will need to stockpile their emissions allowances to ensure that they have adequate allowances through year-end. This will dramatically restrict the trading of

OCCs by reducing the period in which companies will be willing to trade. In addition, it creates a situation in which resources must both restrict their run-times to the most critical periods while also avoiding non-performance penalties under the ISO New England Pay for Performance market structure during electricity shortage events.

Taken together, this establishes an overall situation where Massachusetts-based power plants will have the incentive to offer higher prices into the energy market as a means of not being dispatched in 'normal' periods, in order to preserve their run-times for operation during the times of greatest system stress. This will substantially constrain the ability of ISO New England as the market operator to efficiently dispatch the regional power generation fleet, leading to potential reliability impacts to deal with unexpected occurrences that happen regularly in a diverse and complicated electric grid. By necessity, this also translates into increased costs for consumers.

The bottom line is that regulated entities will require flexibility in order to effectively manage the competing demands of the energy market and environmental obligations. Fortunately, there is now a wealth of experience designing efficient emissions trading systems and we urge the DEP to tap into that experience when developing the compliance system necessary to meet any sector emissions reduction limits dictated by the GWSA. The DEP need go no further than the Regional Greenhouse Gas Initiative (RGGI) for examples of flexibility provisions that allow the sector to accommodate the dynamic nature of the energy market. In particular, a system that limits sector rather than unit emissions, that distributes emission allowances via quarterly allowance auctions, that sets multi-year compliance periods and that allows for banking of compliance instruments provides generators their needed flexibility.



### *New Versus Existing*

DEP proposes bifurcating the regulation of new and existing power generation facilities by allocating 1 MMT of emissions to be split by any new resources in 2018 and have that aggregate cap decline 2.5% annually thereafter. There are three new resources that have cleared in recent ISO New England Forward Capacity Auctions and have Capacity Supply Obligations that begin for one generator on June 1, 2017 and for the two others on June 1, 2019. These resources constitute an aggregate capacity of 1,197 MW. Yet at first examination of Table A in the stakeholder draft, the 1 MMT emissions cap would not fit for an aggregate capacity of that amount.

This puts new resources at a substantial disadvantage to existing ones, even though both are obligated to perform to the exact same reliability and performance requirements for ISO New England. That type of discrimination between new and existing facilities is patently unfair. One potential solution to address this inequity is to create a single emissions cap and reduction schedule for the sector that covers both new and existing facilities and conduct periodic allowance auctions to create a true market for allowances and to provide all generators an equal chance to obtain the allowances necessary for compliance and continued operation. Such an aggregate cap, however, must be well above the 9,119,126 tons proposed in the stakeholder draft.

While DEP is constrained by the GWSA and the recent Massachusetts Supreme Judicial Court decision<sup>6</sup> to set declining emissions regulations on various sectors within the Commonwealth, the GWSA and *Kain* both provide substantial latitude as to how those goals are achieved. NEPGA strongly questions the overall aggregate emissions

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<sup>6</sup> *Kain v. Dep't of Environmental Protection*, 474 Mass. 278 (2016)

cap threshold proposed by DEP and opposes the unit-specific aspect, particularly in light of the new EIA data showing the 2020 emission mandate has virtually been met. NEPGA urges DEP to set an aggregate emissions cap far higher than what was initially proposed. This will help ensure continued competitive pricing and dispatchability for Massachusetts plants, while also complying with the GWSA and *Kain* decision. An aggregate emissions cap can be revised and updated with adjustments made beyond 2020, should they be necessary. A substantially elevated aggregate cap also has the benefit of not discriminating between new and existing resources, allowing for continued appropriate investment to replace retiring facilities.

Failing to increase the cap will likely serve to eliminate future investments in Massachusetts while simply shifting those same investments to bordering states. This will not impact regional GHG emissions but move them a few miles over the border with those jurisdictions then enjoying the host community benefits of increased tax revenues, employment and localized electric reliability. That does not have to be the case.

### **Clean Energy Standard**

NEPGA had filed comments<sup>7</sup> on the previous iteration of a Massachusetts Clean Energy Standard (CES) proposed in 2014. If a CES is to be implemented, NEPGA raises two key issues that should be considered, as originally articulated relating to the CES proposed in 2014.

#### **Eligibility of New and Existing Generators**

Reducing CO2 emissions requires a two-pronged approach – maintaining existing low-carbon resources and providing for new low carbon resources. Thus, a

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<sup>7</sup> Comments filed November 3, 2014 <http://nepga.org/2014/11/nepga-comments-on-massachusetts-clean-energy-standard/>

successful CES must include all resources that have the requisite low-carbon characteristics, in a non-discriminatory manner, including both existing and new generation. If an unanticipated consequence of implementing a CES is to undermine existing low or zero carbon resources, this could cause the retirement of existing generation resources that would otherwise contribute to cost-effectively attaining the emission reduction targets. This would be counter-productive to the intent of the CES. Including both existing and new resources is the best option for meeting the CES's CO<sub>2</sub> emissions goals.

#### *Eligibility of All Resources Meeting the Threshold*

In addition to allowing both existing and new generation to qualify for a CES, all resources – regardless of technology type – meeting the specified emission rate should qualify. NEPGA has consistently advocated that the optimal approach for reaching emissions goals is to develop a standard rate and then allow any resource able to meet the standard to compete. This avoids putting policymakers in the position of picking winners and losers and allows the market to deliver the best mix of resources to cost-effectively meet the CO<sub>2</sub> goals. In addition, resources from both Massachusetts and throughout the region should qualify for the CES as they currently do for the RPS.

#### **Conclusion**

NEPGA appreciates the opportunity to provide these initial comments in response to the stakeholder presentations and discussion drafts posted for review. NEPGA and its members are committed to working with DEP on meeting emissions mandates as specified by the GWSA and the recent *Kain* decision. NEPGA looks forward to continuing the constructive dialogue in this and other proceedings.

**From:** David Donlin

**Sent:** Wednesday, November 16, 2016 10:13:40 AM (UTC-05:00) Eastern Time (US & Canada)

**To:** Strategies, Climate (DEP)

**Subject:** Arlington Gas Leaks

I am writing to express my concern about the number of gas leaks that have gone unattended by the utility companies in Massachusetts. Recently it has come to my attention that there are approximately 20,000 Natural Gas leaks in MA. There are streets in my town where one can actually smell the leaking gas. The methane from the Natural Gas leaks is bad for our health, bad for the plant life around us, adds to the warming of the planet and could pose a safety hazard. Also, we, the consumers, are the ones paying for lost and unaccounted for gas. For all these reasons, we need strict regulations to ensure that the gas companies fix all gas leaks. Identifying and fixing the largest leaks (the "super-emitters") should happen as soon as possible, but we also want all other gas leaks fixed in a timely manner.

## Talking Points for Get Real Public Comments

I represent the Massachusetts chapter of Elders Climate Action. We are a group of senior citizens dedicated to preserving our planet for future generations by taking action now to combat climate change.

The state became a national leader in the fight against climate change with the passage of the Global Warming Solutions Act in 2008 requiring an 80% reduction in GHG emissions by 2050. We recognize this is a huge but absolutely necessary challenge.

While we applaud the governor's Executive Order on an Integrated Climate Change Strategy which focuses on meeting the near term, 2020, goal of a 25% GHG reduction, we are concerned that there are few concrete steps towards meeting the longer terms goals. In particular, the Executive Order does not require the emission limits for 2030 to be set until 2020 and the limits for 2040 to be set until 2030. These dates are far too late to enable the major changes in the electric generation, transportation, and heating sectors needed to achieve our 2050 goal. Targets and strategies are required soon to guide the actions of the private and public sectors as well as ordinary citizens.

We must recognize that most of the GHG reduction that will enable the commonwealth to meet our near term, 2020 goal, resulted from the switch to natural gas from coal and fuel oil for electric generation and heating. However, we are now overly reliant on natural gas. The current GHG emissions from natural gas alone is already one and half times the **TOTAL** GHG emissions from all sources allowed to meet the GWSA 2050 mandate. It is clear, the path to 2020 is not the way forward and we must now begin to undo our reliance on natural gas. Yet, the administration continues to support an increase in natural gas capacity.

We agree with the statement in the administration's Massachusetts Clean Energy and Climate Plan for 2020.

“the only viable path to deep reductions in GHG emissions is through a combination of reduced energy consumption, expanded availability of clean electricity, and electrification of the transportation and heating sectors.”

The task now is to take this broad statement and convert it to an actionable plan with interim targets. We know none of this can be accomplished overnight. The average car today is 12 years old. In order to electrify the transportation sector by 2050, all new cars sold in 2030 must be electric. For heating the task is more challenging. Over 2/3 of the housing in 2050 is already built and only 10% of existing housing is heated with electricity with the rest using natural gas or fuel oil. A major initiative is needed to retrofit existing homes, as well as adopt policies to encourage high efficiency new residential construction with thermal heating.

All of this is dependent on reliable, economical and abundant clean electricity. Federal and state incentives along with dramatic reductions in cost have led to an exponential increase in both solar and wind. Within a few years, it must be determined whether renewables will be able to support the demand for clean electricity or other sources of clean electricity will be required.

While 2050 may seem far away, as elders we know it really isn't. It seems like our children were born yesterday, yet they are older now than the time we have left to mid-century. On behalf of our children and all future generations, we urge the administration to fully embrace the goal of the Global Warming Solutions Act and demonstrate the will to act decisively.

# Get Real

## How does Massachusetts Really get to an 80% reduction in GHG emissions?

Arnie Epstein

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Version 1.1

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## Introduction

Climate change is the single largest threat to our future. Urgent action is needed worldwide to prevent the worst outcomes. Massachusetts is a leader in the country both by adopting aggressive energy efficiency and clean energy programs and by mandating an 80% reduction in GHG emissions by 2050 through the 2008 Global Warming Solutions Act (GWSA - see Appendix A). By giving GHG reductions the force of law, the GWSA is the foundation for current and future actions in the state.

The Environmental League of Massachusetts (ELM) is coordinating the Global Warming Solutions Project (GWSP). The GWSP is a “watch dog” organization which monitors the state’s actions to reduce GHG emissions and issues “report cards” on the progress. The most recent report<sup>[1]</sup> found it unlikely the state

will meet the interim 2020 requirement of a 25% reduction in GHG emission mandated by the GWSA. Even more important, the GWSP found little work being done to plan for the longer term requirement for much deeper cuts in GHG emissions. As stated in the report.

**“Planning for 2050 Must Begin Now, including Interim Requirements for 2030 and 2040 – WE CAN DO THIS!”**

It is recognized that meeting the goal is an enormous challenge and many aspects of the solution are not known. However, this is not a license to delay. A roadmap to 2050, even one with potential different paths, and areas of uncertainty is needed now to help guide the public and private sectors and ordinary citizens. And enough is known today to begin to “get real” about what is needed. The roadmap will aid in identifying areas where more work is required as well as “dead end” policies.

In the public and private sector, a good example of a dead end policy is support for additional natural gas pipeline capacity. As discussed below, over the last 25 years the switch from coal and fuel oil to natural gas for electricity and heating has been the largest contributor to meeting the 2020 requirement of a 25% reduction in GHG emissions, relative to the 1990 baseline. However, the state is now too reliant on natural gas and, going forward, the policy must be to reduce use of natural gas.

By the same token, climate action groups are not immune from advocating unrealistic policies. One theme supported by many groups is reliance on local community based solutions to climate change with little need or desire for support from larger government sectors or private corporations. While community participation is necessary it is by no means sufficient to address this global challenge.

All those who recognize the threat of climate change share a common goal, but many important aspects of the path forward are not shared. A common understanding of the challenges and paths to overcome them will help us all “get real”.

## Summary

For the 2020 goal of a 25% reduction in GHG emissions, the bulk of the reduction is a result of the switch to natural gas from coal and fuel oil for electric generation and heating over the last 25 years. This is not a pathway to the very deep reductions in GHG needed to meet the 2050 requirement and implies we are just beginning the journey.

The cost of solar and wind are reaching parity with the generation of electricity from fossil fuels. As the capacity grows, the biggest challenge will be balancing supply and demand with these variable sources of energy and the key enabler is storage. The development of grid level storage technology will determine:

- If it is possible to rely on solar and wind for the bulk of electric generation or whether other forms of clean energy are needed to provide reliable electric service.
- The geographic location of solar and wind resources and the relative amount of each. In particular, it will determine the level of “energy independence” that can be achieved in the state.



- The requirement for investment in transmission lines across regions of the country.

Transportation and heating are the largest source of GHG emissions and to achieve an 80% reduction in GHG emissions, both sectors must “fuel switch” from fossil fuels to clean electricity and we have barely “scratched the surface”. The transportation sector requires the development of attractive electric and plug-in hybrid vehicles combined with the widespread deployment of the needed infrastructure for recharging. Heating is a larger challenge as most of the “fuel switch” will need to happen in the form of retrofits to existing buildings. These changes will only happen in conjunction with government mandates and incentives.

For clean electricity, the state should continue to focus on adding additional solar and wind capacity. But within the next few years, the different pathways to 100% clean electricity must be evaluated based largely on the projected progress of grid level storage. For the heating sector, the state must make a realistic assessment of how the “fuel switch” to electricity can be achieved with the majority of the buildings being retrofits. For transportation, the state must evaluate the approaches to reducing fossil fuel use. Public transportation, “smart” growth, and increased walking and bicycle use all make a difference, but will not make the contribution required. Electric or plug-in hybrid vehicles will need to make up essentially the entire fleet to meet the goal.

The economic impact of a deep reduction in GHG emissions will be significant, at least in the short term, as financial stimulus is needed both to transition to clean energy and to “fuel switch” to electricity, particularly in the transportation and heating sectors. The stimulus may be in the form of a “carbon tax” and/or specific incentives to promote clean energy. It will be necessary for the stimulus to promote the correct mix of clean energy and be fair and equitable such that no group is excessively advantaged or disadvantaged. Also, many of the pathways to clean energy rely on coordination with other regions where Massachusetts would be an energy importer, much as it is today with fossil fuels. These issues could become difficult politically as the state would appear to be penalized for being a leader in the fight against climate change. On the other hand, we will realize significant economic benefits as a center for clean energy R&D and the creation of new clean energy jobs.

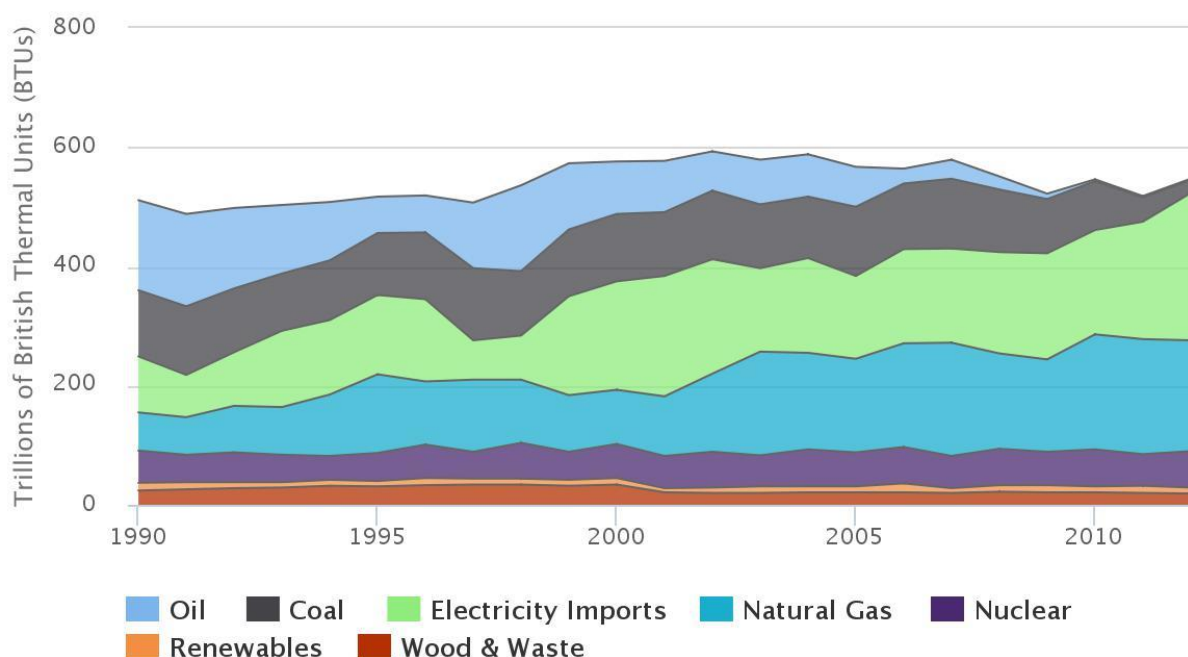
## How will the state meet the 2020 Goal of a 25% reduction in GHG compared to 1990 baseline?

An interim requirement of the GWSA is to achieve a 25% reduction of GHG emissions, as compared to the 1990 baseline, by 2020. If the state achieves a 25% reduction in GHG emissions this would appear to be an excellent achievement and a good start towards meeting the 80% GHG emissions reduction mandated for 2050. However, a closer look reveals the bulk of these reductions were underway when the GWSA was passed in 2008 and had relatively little to do with a policy directed towards reducing GHG emissions. Moreover, the approach used to achieve these reductions is not a “springboard” towards further emissions reductions. Rather, they will actually need to be “undone” to achieve much deeper cuts in emissions.

Between 1990 and 2013 two sectors, electricity and buildings contributed essentially all the GHG reductions. Of the total reduction of 18% achieved, 13% was in the electric sector and 6% in the building sector (GHG emissions from transportation actually increased). According to the latest Mass Clean Energy Climate Plan for 2020 (CECP)<sup>[2]</sup>, essentially all the GHG reduction in the electric sector resulted from switching from coal and fuel oil to natural gas for electric generation (page 9 of CECP). The figure below shows Massachusetts electric power fuel use between 1990 and 2012. In 1990, coal and oil accounted for 63% of electricity generated in Massachusetts and natural gas was 15%. By 2010, this had almost been reversed with coal and oil accounting for only 23% of electricity generation and natural gas 52%.

## Electric Power Sector Fuel Use in Massachusetts

Source: US EIA State Energy Data System (2013)



Reductions in the building sector resulted from switching from fuel oil to natural gas for heating and energy efficiency measures. Thus, about 2/3 of the total GHG emissions reductions required to meet the 25% mandate (15 of the required reduction of 24 MMTCO<sub>2</sub>e) were met by switching to natural gas for electric generation and heating. These changes were motivated at least as much by economic considerations as a desire to reduce GHG emissions. Moreover, some would claim the GHG reductions from natural gas are inflated given recent findings on methane leaks.

To meet the balance of the requirement (6 MMTCO<sub>2</sub>e) to achieve a 25% reduction between now and 2020, the state was looking primarily to additional hydro imports from Quebec and some contribution from solar and wind and additional reductions from building space heating through conversion to natural gas and efficiency measures (2 MMTCO<sub>2</sub>e).

Although solar and wind are high visibility sources of clean energy, they have yet to make a very significant contribution to GHG reduction in the state. It is estimated between 2009 and 2020, the annual reduction in GHG from renewable electric generation will be 1.1 MMTCO<sub>2</sub>e as compared to 4.0 MMTCO<sub>2</sub>e from clean energy imports (primarily hydro) and 4.4 MMTCO<sub>2</sub>e from energy efficiency measures.

None of this is to suggest the state is not committed to achieving the deep reductions in GHG emissions mandated by the GWSA. It does however highlight the magnitude of the challenge. A relatively small portion of the emissions reductions to date, achieved through energy efficiency and clean electricity, have been through initiatives that can be built on to achieve our larger goals. While the bulk of the reductions, achieved through “fuel switching” from coal and fuel oil to natural gas, will need to be “undone” with most use of natural gas replaced by again “fuel switching” to sources of clean electricity.

## Sources of Clean Energy

While wind and solar are now thought to be almost synonymous with clean energy, there are other sources of clean energy which may need to make a significant contribution. There may be good reasons to prefer wind and solar, but the variable and unpredictable nature of their electric output is a challenge to their integration on the grid at high levels of penetration. As discussed below, unless major advances are made in grid level storage, it will not be possible to use only solar and wind to provide the bulk of electric generation. Other sources of clean energy should not be “ruled out”. The stakes are too high. In particular.

- New technology for nuclear power can produce safer, smaller, and more cost effective nuclear plants. In the U.S. nuclear power accounts for about 20% of electric production while in France it is 75%.
- Hydro currently accounts for about half the renewable energy produced in the U.S. and about a third of the renewable energy consumed in Massachusetts. Hydro has the advantage of not being a variable source of energy as with solar and wind. It is a mature technology and no major improvements are anticipated. Total hydro capacity is not increasing significantly and it will not be capable of contributing a much greater amount of clean energy in the U.S.
- Biofuels have the advantage of producing liquid fuel for transportation. Corn based ethanol has been a disappointment both because production results in GHG emissions comparable to petroleum products and because the corn is not available as food. However, research and development continues on a range of biofuels without these problems which, if they can be economically scaled, would make a dramatic contribution.
- Other renewables; Biomass, Geothermal, Wave. Biomass and Geothermal electric generation are relatively mature technologies. Geothermal electricity is produced almost entirely in the western U.S. Together, these sources of renewable energy account for about 2% of total U.S. electric generation. Wave power is in the pilot stage at several sites and larger installations are planned.

- Carbon capture and sequestration (CCS). CCS is usually thought of in conjunction with coal fired plants (“clean coal”). The approach is to capture CO<sub>2</sub> emissions and deposit them where they will not enter the atmosphere, normally in underground geological formation. For Massachusetts, there is already practically no coal fired sources of electricity, so “clean coal” is not needed. However, CCS can also be used in conjunction with natural gas plants and depending on the approach used to integrate very high penetrations of variable renewables on the grid (wind and solar), a significant amount of natural gas generation may still be required to serve as “peakers” when a steep ramp of electricity is needed to meet demand. On a larger scale, in the U.S. and globally, coal accounts for about 40% of electric generation. In the developing countries, India, China, and much of Southeast Asia, new coal plants are being built at a record pace to satisfy the demands of these growing economies. While these countries recognize the threat of climate change and are particularly vulnerable, clean energy solutions do not exist at the scale needed. CCS may be the only solution for these nations. To date, experience with CCS has not been promising. Pilot clean coal plants in the U.S. have experienced enormous cost overruns.
- Research continues on fusion, the clean source of energy which is perpetually “20 years in the future.” Other technologies, such as the use of photosynthesis for clean energy production are being explored. All realistic options for economical clean energy which can be scaled to make a difference, should be “on the table.”

## How will Variable Renewable Energy be Integrated on the Grid?

The “elephant in the room” for high penetration of variable renewables (wind and solar) is grid integration. Grid integration for renewables means load balancing between supply and demand when the supply is a source of electricity which is variable over time and not fully predictable.

As long as the penetration of variable renewables has been low, around 15% or less, grid integration has not been a major issue. There is sufficient flexibility from other sources of electricity to accommodate the renewables while balancing supply and demand. However, as the penetration of variable renewables increase, existing mechanisms for load balancing are no longer up to the task and there will be periods of oversupply, when most of the available electricity is discarded (the industry term is “curtailment”) and periods of undersupply where there isn’t sufficient electricity to meet demand. Surely this isn’t what is envisioned for 100% renewables.

With the goal of 100% clean electricity by 2050 and with the bulk of the clean electricity generated by variable renewables, the biggest challenge is grid integration. There are several primary approaches for integrating very large amounts of variable renewable energy<sup>[15][16]</sup>. A key point is that, except for storage, none of the other approaches enable the bulk of electricity to be provided through solar and wind. Each of the other approaches enables deeper penetration of these variable renewables but would still require a significant amount of total electric generation to be provided through other sources.

### Energy efficiency.

Reducing the total demand for electricity supports all other mechanisms for grid integration. However, even with aggressive efficiency measures, it is expected demand for electricity will increase significantly as the largest consumers of fossil fuels, transportation and heating, fuel switch to clean electricity.

### Change time of demand to more closely match time of supply.

On a daily basis, peak demand currently occurs in the late afternoon, while for solar the period of peak supply is around noon and by late afternoon, power from solar is rapidly diminishing. There are a number of approaches to change the time of demand ranging from LED lighting to controlling the time water is heated or using ice or chilled water in air conditioners to allow power to be temporally stored. Quite possibly the largest factor in demand time will be charging electric vehicles. If most private electric vehicles are charged at home, it would be in the late afternoon, after work. This will make the existing late afternoon peak demand much more pronounced and result in an even greater challenge for integrating renewables.

### Aggregating the source of renewable energy

For both solar and wind, there are preferred geographic locations which result in higher output. Of even greater importance, a significant amount of the variability of solar and wind can be reduced by aggregating the output over large geographic regions since the sun will be shining or the wind blowing in one region during cloudy or calm periods in another. Also, solar and wind are complementary sources of clean electricity. Solar output is highest in summer months and lowest in the winter, by a factor of about two. On the other hand, in the eastern U.S. it tends to be somewhat windier in the winter than in the summer. So the decreased output from solar in the winter can be somewhat offset by increased output from wind. These factors will impact the location and amount of solar and wind as discussed below.

### Storage.

Theoretically, the variable output of solar and wind could be accommodated if there existed sufficient storage to store the output during periods of excess supply to be used when the power from solar and wind couldn't meet the demand. For grid level storage, pumped hydro is the only technology that has been deployed at scale. With pumped hydro, excess electric generation is stored by using it to pump water uphill to a reservoir. When additional electricity is needed, the water runs back downhill through a turbine to generate electricity. An issue with pumped hydro and other large scale storage is the requirement for a large geographic area with particular features.

While other approaches to grid level storage are being explored, batteries are receiving the most attention and R&D investment. Batteries have the inherent advantage of not being dependent on location as with pumped hydro. On the other hand, a battery technology does not yet exist which meet the needs of large scale grid storage<sup>[5]</sup>. Currently Lithium-Ion batteries, developed over the last twenty years primarily for use in portable electronic devices and electric cars, are the best technology available. The cost of Lithium-ion batteries has decreased dramatically with economies of scale. But one major barrier to widespread deployment is limited lifetime as a function of charge/discharge cycles. For grid

level deployment, a battery should last many years and continue to operate after thousands of cycles. Lithium-ion batteries last around a thousand cycles and much of the current research is directed towards battery technologies “beyond Lithium-ion.”

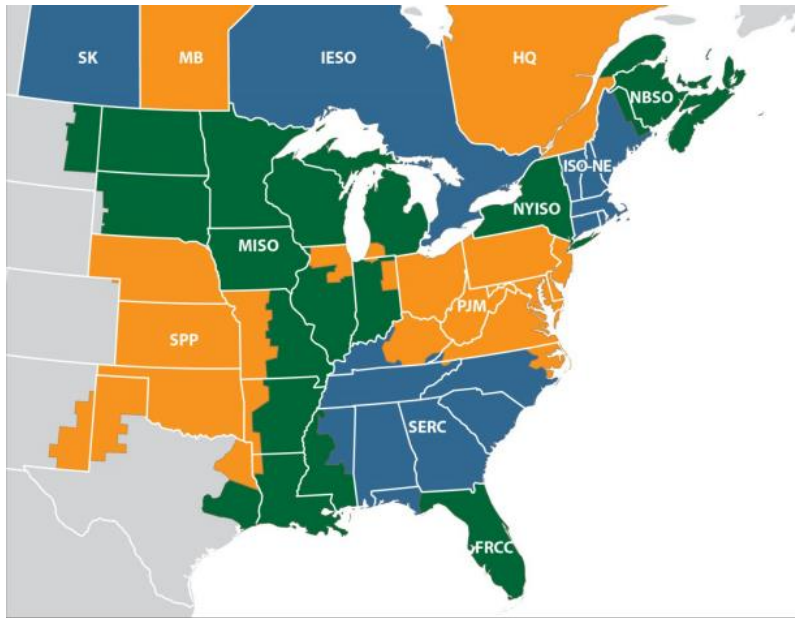
## Where will the State’s Renewable Energy be Generated without a Significant Contribution from Storage?

Massachusetts has always been a net importer of energy. All fossil fuels for transportation and heating are from out of state and much of the electricity, particularly nuclear and hydro is also. For many, a goal of the switch to renewable energy has been for the state to become “energy independent.” This is motivated primarily by economic and political reasons. The state benefits from clean energy jobs and it is to our advantage to “control our own destiny” rather than rely on other regions of the country. Also, for some, local energy generation also represents a more sustainable, community based approach that reflects a desire to move away from large scale energy projects.

Though it may be desirable, unless there is a breakthrough in storage technology, the switch to renewable energy will not make us energy independent at the community, state, or even regional level. This is primarily for two reasons.

- Massachusetts is not ideally suited for solar generation. The annual output from the same solar array in New Mexico is about 40% greater than in Massachusetts. The difference is particularly pronounced in winter months (more on this below). During the winter, a solar array in Massachusetts produces about half the power of the same array in New Mexico. However, the winter months will become the time of peak electric demand as heating “fuel switches” from fuel oil and natural gas to electricity. For wind, Massachusetts has very good offshore potential but poor for most onshore locations. This makes wind a good choice for large scale offshore wind power but a poor choice for community based energy generation.
- A key approach for integrating the variable renewables, wind and solar, at large penetrations on the grid is aggregation over large geographic areas. The sun will be shining and the wind blowing in some regions while it is cloudy and calm in others. By integrating the output from different regions, the inherent variability of these sources is both smoothed and broadened. A community does not provide for this integration. Neither does the entire state or all of New England.

A recently released study by NREL<sup>6</sup> (National Renewable Energy Laboratory) looked into the potential for a 30% penetration of wind and solar within the EI (Eastern Interconnection) region without a significant contribution from storage. The EI encompasses a huge geographic area bounded by New Brunswick, Florida, Saskatchewan, and New Mexico.



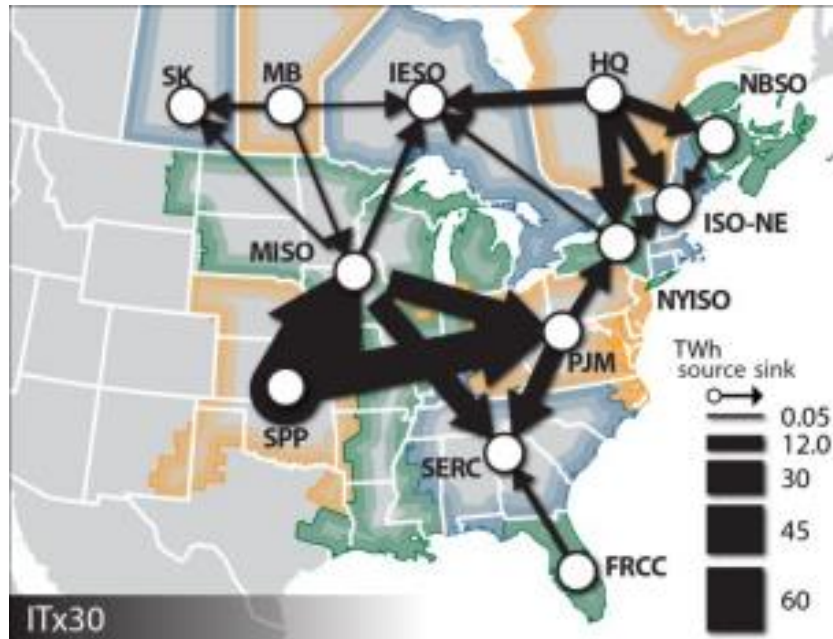
### **EI Region**

(source: NREL Eastern Renewable Integration Study<sup>[6]</sup>)

The study found it is possible to achieve a 30% penetration of wind and solar within the EI region if it were possible to instantaneously balance supply and demand across the entire region. While it is currently not possible to achieve this magnitude of load balancing, it is certainly conceivable that it could be done.

One finding from the study is the identification of regions that are net exporters and net importers of wind and solar energy. As shown in the figure below, the study found that New England is an importer of energy. New England imports about half the energy consumed in the region and exports essentially nothing.





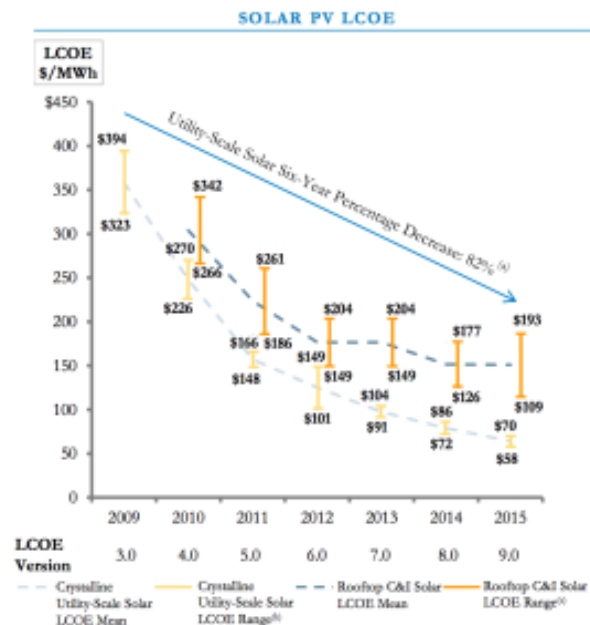
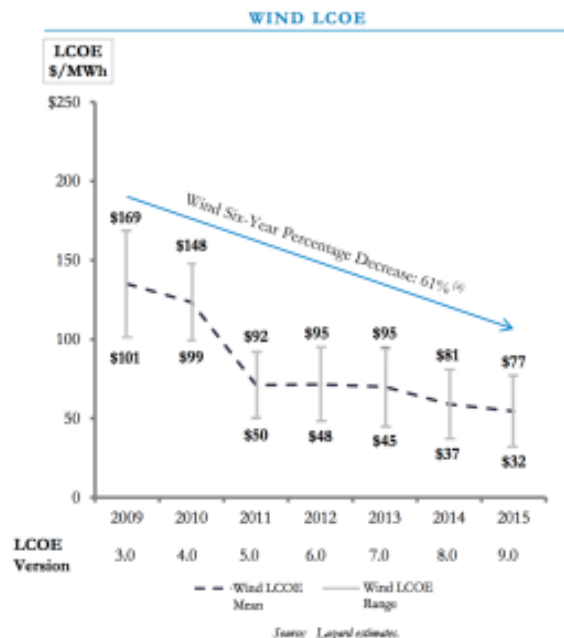
### Net Energy Interchange between Regions at 30% Wind and Solar Penetration

(source: NREL Eastern Renewable Integration Study<sup>[6]</sup>)

Keep in mind this study did not assume a significant contribution from storage. If a technology was found which satisfied the requirement of large scale grid storage, the figure above could be quite different as there would be less need to integrate wind and solar over a large geographic area. It would also reduce the requirement for added transmission capabilities over long distances as the penetration of wind and solar increased.

## Solar versus Wind and the Role of Storage in Massachusetts

If it is assumed the bulk of clean energy is provided by solar and wind, how much of each should be built? As the figure below demonstrates, at a utility scale, the LCOE (Levelized Cost of Electricity) for wind and solar are approaching parity and are becoming competitive with fossil fuels<sup>[8]</sup>. This might suggest there was little to choose between wind and solar. Solar also has the advantage of being more scalable. Installations can range from a few solar panels to acres of panels, and there are fewer location constraints for a good solar installation as compared to a good wind installation.



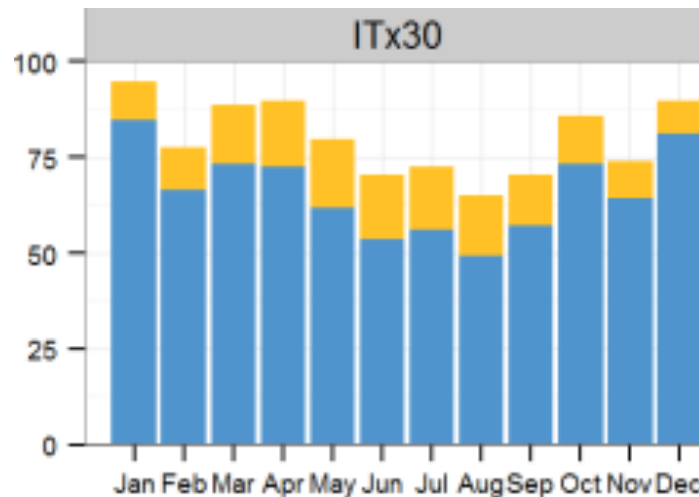
### LCOE of wind and solar

(source: Wind & Solar Cheaper Than Fossils & Nuclear Now<sup>[8]</sup>)

However, wind is less “variable” over the course of a day or a year. It is also more predictable than solar. This gives wind a significant advantage. As mentioned earlier, in the east, wind and solar are complementary in that solar output is higher in the summer and wind is higher in the winter. The NREL study referenced above, found that with sufficient transmission capability across the eastern region, there would be about twice the capacity of wind as compared to solar to achieve a 30% penetration and that solar would be used largely to balance the output variation of wind between winter and summer (see illustration below).

Another issue is the relative contribution of utility scale versus “rooftop” solar. Since solar is more scalable than wind and less reliant on location, homeowners can install solar on their roof while corporations develop large multi-megawatt utility scale installations. As shown in the figure above, the cost of rooftop solar, per unit of electricity, is about twice that of utility scale installations. To date, the enormous growth of solar in the state has been due to a collection of incentives (tax credits, SRECs, rebates, net metering) which generally favor smaller installations<sup>[17]</sup>. This can be seen as a way of offsetting the higher cost of rooftop solar to make it affordable for homeowners. It also supports the movement towards more community based clean energy generation. On the other hand, this incentive policy does not maximize the clean energy benefit of these incentives (less electricity is generated per dollar of incentive for residential than utility scale solar) the cost of which are ultimately borne by all residents. These incentives are also largely responsible for the “pushback” from utilities in Massachusetts and many other states, which claim they result in “cost shifting” from customers without solar to customers with solar.

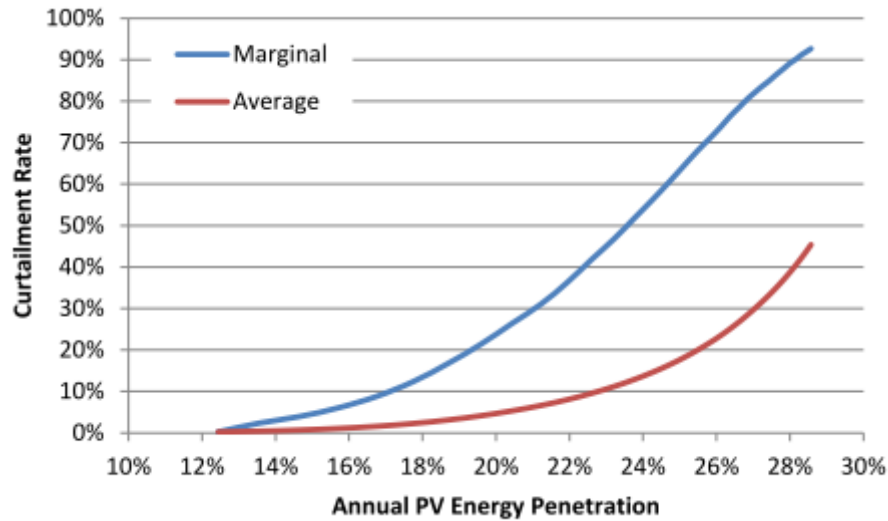
Ultimately, the level of incentives will decrease as the cost of solar continues to decrease. Note also that as the penetration of solar increases, the benefit decreases if other actions aren't taken to integrate this variable renewable on the grid. We certainly don't want to be in the situation of providing incentives to install additional solar which provides little additional benefit.



**Wind (blue) and Solar (yellow) Generation by Month in the EI region with Sufficient Transmission Capacity (30% total penetration)**

(source: NREL Eastern Renewable Integration Study<sup>[6]</sup>)

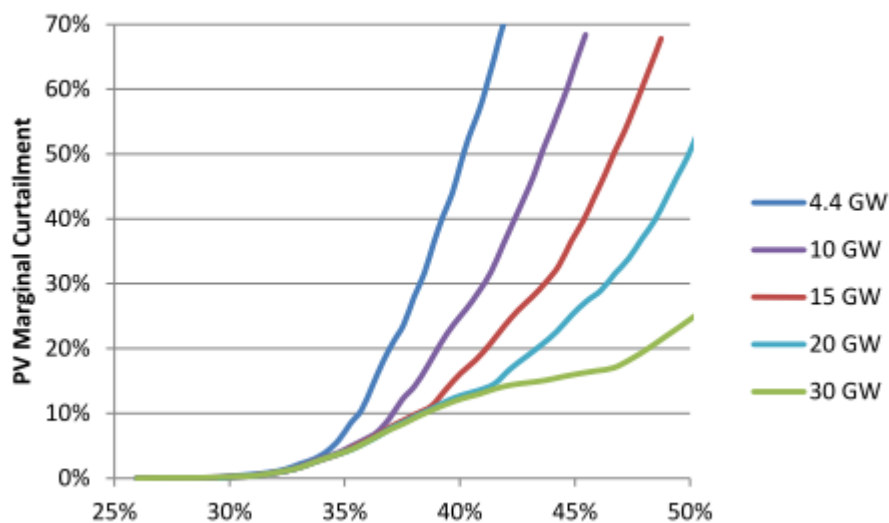
As mentioned above, the introduction of a significant amount of grid storage could change both the geographic location and relative amounts of solar and wind. Another recent NREL study<sup>[7]</sup> focused on storage requirements by analyzing how much storage would be required in California to achieve a 50% penetration of solar. Because solar energy is only produced during daylight, it was found that, without storage, and given current conditions, the maximum penetration of solar is relatively low as illustrated in the figure below.



(source: NREL Energy Storage Requirements for Achieving 50% Solar Photovoltaic Energy Production in California<sup>[7]</sup>)

The blue line in the figure is the “marginal curtailment rate”. This represents the percentage of solar energy that can be used from building additional solar installations as a function of the energy penetration of solar. As shown in the figure, with an energy penetration of 28% solar, over 90% of any additional solar would be discarded (“curtailed”). This clearly makes no sense and, given current conditions, the maximum reasonable penetration of solar is around 20%.

The study then examines various “flexibility” options in California and their impact on solar curtailment and storage requirements. The figure below illustrates the results for the “high flexibility” scenario. This case takes maximum reasonable advantage of the mechanisms for integrating variable renewables on the grid outlined above.



**PV Penetration for “high flexibility” Scenario**

(source: NREL Energy Storage Requirements for Achieving 50% Solar Photovoltaic Energy Production in California<sup>[7]</sup>)

As illustrated above, assuming maximum utilization of other grid integration mechanisms, solar penetration greater than 35% is not reasonable without grid level storage. But with 30 GW of storage, a penetration of 50% without discarding (“curtailing”) more than 25% of the solar energy is achievable. To put this in context, California is the first state in the nation to require grid level storage. The requirement for 2020 is 1.3 GW. So to achieve 50% penetration requires about 25 times this amount of storage.

The energy bill passed in Massachusetts at the end of July, includes a provision to decide whether to set a procurement target for “viable and cost-effective energy storage systems”<sup>[9]</sup>. If the state does begin to deploy storage on the grid, it could be the start of an initiative to enable a more local and resilient energy system based largely on solar and wind.

It is clear that massive deployment of storage is the way deep penetration of solar and wind can be achieved. What is not clear is whether the technology will be available to support this requirement in time. It is also not clear how these systems will be financed. At high level of penetration, the cost of the storage may be comparable to the cost of the solar and wind. Since storage is the technology which enables deep penetration of these renewables, should this be “bundled” into the cost of the renewable or borne by ratepayers?

The availability of storage will, to a large degree, determine the path to clean energy. Without an enormous deployment of storage, the state will need to rely on a combination of clean energy sources both in-state and in other regions of the country. Added interstate transmission infrastructure is needed. And a significant amount of the clean energy will not be generated by solar or wind.

## Transportation and Heating

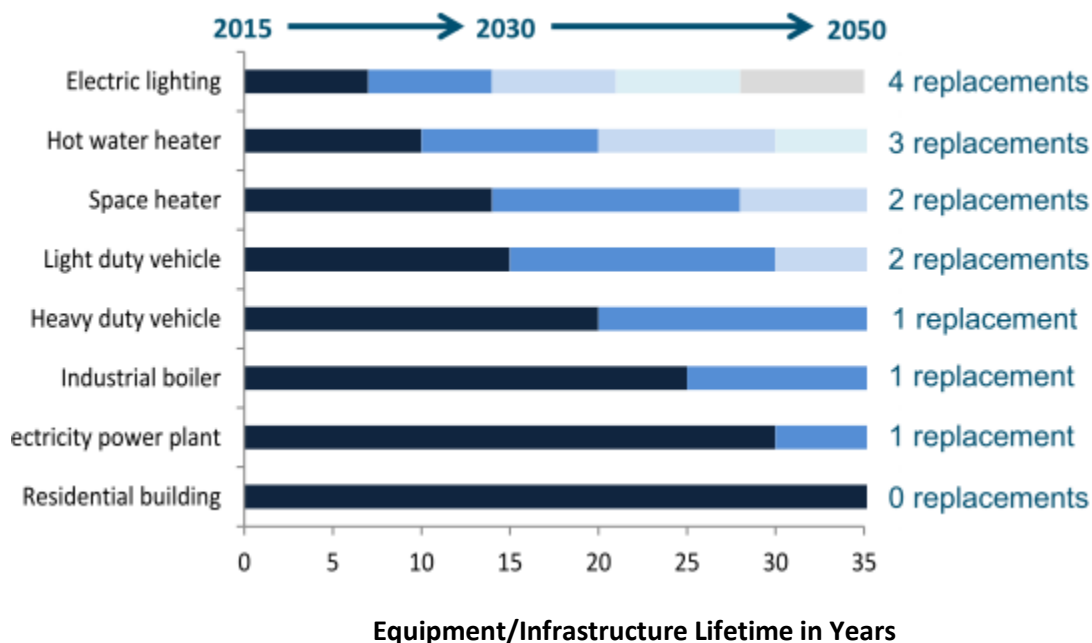
Transportation and building heating and hot water are the largest contributors to GHG emissions in the state. Transportation alone is responsible for 42% of GHG emissions and residential another 17%. All these emissions are due to the burning of fossil fuels; gasoline, diesel, natural gas, and heating oil. Thus, any roadmap to an 80% reduction in emissions must address these two sectors. Barring an unexpected breakthrough in biofuels, this must be achieved largely through electrification. As stated in the CEC<sup>[2]</sup>.

“the only viable path to deep reductions in GHG emissions is through a combination of reduced energy consumption, expanded availability of clean electricity, and electrification of the transportation and heating sectors.”

While the requirement is recognized by the state, a plan to achieve the needed reductions is required. The state has a number of initiatives to begin to address the issue such as “Smart Growth” and “GreenDOT”. Additional support at the federal level is provided through vehicle efficiency and GHG standards. However, through 2020, GHG reductions in transportation and buildings is anticipated to come almost entirely through energy efficiency measures rather than fuel switching to electricity. And while energy efficiency is key, it cannot produce the very deep reductions required for GHG emissions. With the growth of the suburbs made possible by private cars, the state does not have good options to

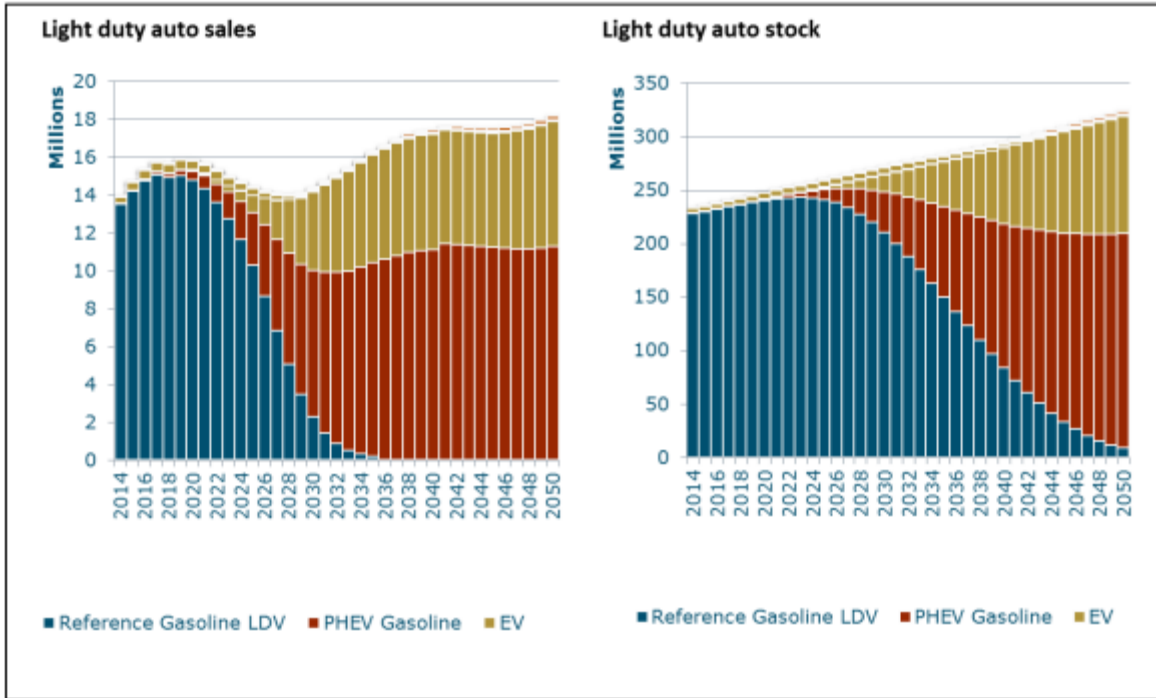
dramatically reduce GHG emissions from transportation through increased use of public transportation, walking or bicycling. And VMT (Vehicles Miles Traveled) is much greater per resident in suburban and rural areas.

One way to look at the challenge is through “replacement rates.” The figure below shows typical replacement rates for a variety of equipment from now through 2050.



(source: Pathways to Deep Decarbonization in the United State<sup>[10]</sup>)

As shown below, with the replacement rate shown above for private cars (“light duty vehicle”), the sale of cars powered by gasoline or diesel must reduce dramatically within 10 years and end by 2030.



**Sales Volume of Electric Vehicles (left) and Number of Electric Vehicles (right) through 2050**  
 (source: Pathways to Deep Decarbonization in the United State<sup>[10]</sup>)

Fuel switching for heating from fuel oil and natural gas to electricity will be a greater challenge than transportation because most buildings will need to be retrofit. For a retrofit, the least costly installation may be electric resistance heating using baseboards. However, this will also be the most expensive to operate. Air-to-air or geothermal heat pumps are three to four times more efficient than resistance heating but would be more difficult or not possible to install in a number of buildings.

A key point to recognize in “fuel switching” to electricity in the transportation and heating sectors is that it is independent of the fuel used to generate the electricity. It is often pointed out that electric cars are no more “clean” than the source of electricity used to power them. If an electric car is charged by electricity generated from a coal fired plant, than it could actually be “dirtier” than today’s cars powered by gas. While true, an electric car will continuously get cleaner as the source of electricity does. So long as the switch to electricity is combined with a policy to transform the electric sector to clean electricity, the switch must get underway with sufficient lead time. As illustrated above, if the target date for a clean electric sector is 2050, all new cars sold must be electric by 2030 to have the fleet converted by mid-century.

For both transportation and heating, the state will need to structure programs that are fair and cost-effective yet insure that the transition occurs. Depending on the path adopted for clean energy, there



may be many more jobs created in the state for energy efficiency measures, retrofitting building heating systems, and infrastructure for electric cars, than there are in solar and wind.

## Conclusion

Although a leader in the country, the state is not far along the path towards the very deep reductions in GHG mandated for 2050 by the GWSA. Most of the progress made to date has been due to the switch from coal and oil to natural gas in the electric and heating sectors. This is not a pathway to an 80% reduction in GHG and highlights the need for a roadmap to 2050.

Though a number of uncertainties remain, planning must begin soon. Not least because of the long lead times needed for change. The governor recently signed an executive order requiring the state to set GHG reduction targets for 2030 by 2020 and for 2040 by 2030. As we've seen, this is far too late. For example, in order to electrify private transportation, the sale of gas powered cars must end by 2030. It is hard to see how this would happen if we don't have a target and plan for GHG reductions for 2040 until 2030.

A near term roadmap to 2050 would be helpful to climate action groups. Many different ideas are being advocated and a DOE roadmap would be a good way to calibrate them and generate useful discussions.

The roadmap will probably include different pathways depending on technology, policy, incentive structure, and support and coordination with the federal government and other regions of the country. It will provide a sense to government agencies, corporations, and residents about what changes are needed and how it will affect them.

We can't afford to "kick the can down the road." We've already waited too long.

## Appendix A - Global Warming Solutions Act

The Global Warming Solutions Act (GWSA) was signed into law in 2008<sup>[12]</sup>. The primary goal being an 80% reduction of GHG emissions in the state by 2050 relative to a 1990 baseline. This goal is in conformance with the required emissions reductions needed globally to stabilize the climate<sup>[18]</sup>.

The other major components on the GWSA are:

- A 25% reduction in GHG emissions, relative to 1990, by 2020
- Establishment of a reporting and verification mechanism of GHG emissions
- Establishment of interim 2030 and 2040 GHG emissions limits and plans to achieve them
- Publish at least every 5 years a plan for achieving GHG reductions including plans to implement the 2030, 2040, and 2050 emissions limits
- Publish annually the GHG emissions and reductions by sector.

The state has published periodic assessments of progress towards the 2020 GHG emissions target<sup>[2]</sup>. A recent case decided by the SJC was with regard to the last point (chapter 21N, section 3d). The SJC ruled the state has not been meeting its requirement to publish annual reports of GHG emissions and reductions by sector. The state has not yet established interim 2030 and 2040 GHG emissions limits. The first 5 year progress report for achieving GHG reductions was published in 2013<sup>[11]</sup>. It does not contain a plan to achieve the 2030, 2040, or 2050 GHG reductions, in part because the emissions limits for 2030 and 2040 have not yet been established.

On September 16, 2016, the governor signed executive order 569 – Establishing an Integrated Climate Change Strategy for the Commonwealth<sup>[19]</sup>. The Executive Order addresses the findings of the SJC and establishes a focus on climate change adaption and resiliency as well mitigation. The executive order has been generally praised by environmental groups. However, it establishes 2020 as the date for setting emissions limits for 2030 and 2030 as the date for setting emissions limits for 2040. This is too late and the interim limits and plans for achieving them, as well as the 2050 80% reduction are needed in the next few years if we expect to achieve the goal of the GWSA.

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November 21, 2016

Mr. Jordan Garfinkle  
Massachusetts Department of Environmental Protection  
One Winter Street  
Boston, MA 02108

***Re: Exelon Corporation's Comments on the Massachusetts Department of Environmental Protection's Proposed Draft Regulation on Reducing Greenhouse Gas (GHG) Emissions From Electricity Generating Facilities Program***

Dear Mr. Garfinkle:

Exelon Corporation ("Exelon") appreciates the outreach by the Massachusetts Department of Environmental Protection ("DEP") regarding the discussion draft ("Draft") of 310 CMR 7.77, Reducing GHG from Electricity Generating Facilities Program, prior to the formal rulemaking. Exelon, which is one of the largest and cleanest competitive power generators in the United States, supports the greenhouse gas ("GHG") reduction goals of Massachusetts. Exelon is among the least carbon-intensive generators, producing nearly 200,000 gigawatt-hours ("GWh") annually, or as much as is generated in the State of California. Eighty-seven percent of Exelon's generation is carbon-free nuclear, hydroelectric, wind or solar; the vast majority of the remainder is natural gas-fired.

The goals of the DEP's Draft are to "limit and reduce GHG emissions by establishing a cap on the amount of GHG emissions that can be emitted from the largest electricity generating facilities in Massachusetts." Therefore, our comments focus on how DEP should design its program to ensure that Massachusetts intrastate generation is not put on an uneven footing with out-of-state generators to no environmental gain (or even to its detriment), and that all generators receive the right market signals to continue abating GHG emissions while maintaining the reliability of electricity service in the Commonwealth. If done correctly, the confluence of

emissions regulations in Massachusetts will reduce carbon dioxide (“CO<sub>2</sub>”) emissions in a way that maintains an affordable, reliable, and increasingly clean electricity grid. Exelon respectfully submits comments on the Draft, which highlight the following main points:

- Recommendations consistent with the direction of the Global Warming Solutions Act (“GWSA”), Mass. Gen. Laws ch. 21N, as clarified by *Kain v. Department of Environmental Protection*, 474 Mass. 278, 280, (Mass. 2016) (“*Kain*”);
- Support for an auction-based design for the GHG Emissions Cap Program as modeled after the Regional Greenhouse Gas Initiative (“RGGI”);
- Discussion of the implications of an emissions cap system that does not anticipate “leakage” from out-of-state carbon intensive generation facilities in order that DEP may properly address or seek comment on this issue; and
- Implications of the resiliency of the NE-ISO region as it relates to Massachusetts-based generation assets.

Exelon appreciates the opportunity to offer these comments on the Draft, and we look forward to working with DEP as the process continues with the development of CO<sub>2</sub> reduction strategies. We encourage DEP to continue its practice of utilizing an open stakeholder process and engaging in outreach. As there are many questions yet to be resolved, thoughtful consideration should be given to the outstanding details before any policy is established. Please contact the undersigned below if you have any questions.

Sincerely,

/s/Daniel Allegretti

Daniel Allegretti  
Vice President, State Government Affairs – East  
Exelon Corp.  
1310 Point Street, 8<sup>th</sup> Floor  
Baltimore, MD 21202  
Office: 603 224 9653 | Mobile: 603 290 0040  
[daniel.allegretti@exeloncorp.com](mailto:daniel.allegretti@exeloncorp.com) [www.exeloncorp.com](http://www.exeloncorp.com)

## COMMENTS

### **I. The DEP Should Propose Emissions Caps to 2030**

The Draft proposal is intended to meet the directive under *Kain*, which found that DEP must promulgate regulations to fulfill the carbon reduction goals of the GWSA. DEP has discretion in shaping emissions reduction policies as no specific avenue of regulation is prescribed by the GWSA or *Kain*. As noted by DEP in *Kain*, Massachusetts has already engaged in many successful GHG mitigation programs for the power sector. To comply with *Kain*, DEP has begun work on several new initiatives, including the Clean Energy Standard (“CES”). The Draft is one of DEP’s suggested methods of CO<sub>2</sub> reductions, which sets emissions caps for large-scale, in-state generators that decline at a rate of 2.5% per year until 2050, a roughly thirty-year period. Exelon supports declining emissions over time. A number of factors should be taken into account in determining the proper rate of that decline, including the success of the Regional Greenhouse Gas Initiative (“RGGI”), the changing regional energy resource landscape, reliability requirements, changes in load and changes in carbon emissions from other sectors, which together may increase or decrease the optimal trajectory.

The GWSA explicitly envisions DEP creating a new plan and setting a new limit in 2030, 2040 and 2050. In the Draft, DEP suggests setting specific emissions caps to 2050. While a long-term standard generally provides certainty for the market and is beneficial to those making investment decisions, this benefit must be weighed against the value of leaving room to account for changing circumstances. Thus, a successful GHG emissions reduction program will account for these nuances to prevent inefficiencies that would be counter-productive to the stated goals. To counter these challenges, we recommend that DEP establishes specific caps to 2030, and identify broad goals for post-2030. DEP can then set a new declining rate based on an

assessment at the time as to the success of GWSA reductions in 2030, how the caps are affecting overall emissions from facilities across the region and changes in energy resources within the state and region.

## **II. Lowering Carbon Emissions Efficiently**

### **A. Designing the GHG Reduction Emissions Cap Program**

#### **1. An Auction would Encourage Greater Power Sector-Wide Efficiencies**

In order to administer the GHG emissions reduction program, DEP should consider the allocation of allowances under an aggregate cap through an auction mechanism. As recognized in numerous market-based emissions reduction policies, including RGGI, this design will encourage the most efficient resources as opposed to an allocation that rewards historically higher-emitting sources and requires significant staff resources to administer. Importantly, an annual auction will place new and existing resources on an equal and competitive footing, promoting the most efficient resources and encouraging emissions reductions. Moreover, Exelon recommends that all electric generating facilities, including those under 25 MW, be included in the cap and any auction process. Thus, this framework will encourage generators to seek new efficiencies to meet their cap.

An auction mechanism also provides generators with flexibility to meet market needs in an evolving energy environment and avoids the problems associated with the Draft's use of a three-year historical data analysis of section 310 CMR 7.77 (4)(e). Many factors can affect generator dispatch during a three-year period such as maintenance, transmission outages, local network contingencies, fuel supply issues, etc. Thus, historical data is simply not a good reflection of the relative efficiency and the need for particular generation resources. This is especially true since the utilization of peaking generation is evolving as more intermittent renewable resources come



on line. Further, as DEP and other jurisdictions have acknowledged in previous programs, auctions are far more efficient at encouraging cost-effective emissions reductions.

In terms of designing the auction platform, the infrastructure to conduct such an auction is readily available from third parties. For example, DEP could look to how RGGI developed its auction functionality and potentially leverage the same successful platform.

## **2. Any Allocation Set-Aside for New Facilities Must Promote Cost-Effective Emissions Reductions**

In the event that DEP proceeds with an allocation, rather than the preferable auction, the set-aside for new, more efficient resources (the “New Facility Set Aside”) should be expanded to be a greater proportion of the total aggregate cap on GHG emissions. The New Facility Set Aside should account for the growing share of Massachusetts’s fossil sector represented by newer, more efficient facilities and increase that share accordingly.<sup>1</sup> For example, Footprint Power will enter service in 2017 and will consume most, if not all of the New Facility Set Aside proposed in the Draft, leaving West Medway at a competitive disadvantage when it comes online in 2018. In effect, the Draft would prejudice new generation in favor of older models, at the expense of emissions reductions. This is a perverse result and is inefficient from both a market and environmental perspective.

Specifically, the Draft proposes a New Facility Set Aside of one million metric tons, a number that is set to decrease by 2.5% until 2050.<sup>2</sup> By any reasonable measure, a one million

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<sup>1</sup> Note: In this scenario, we are recommending devoting a larger share of allowances to newer units; we are not advocating a larger total cap.

<sup>2</sup> The prospect that New Facilities will be able to procure significant Over Compliance Credits (“OCC”) is simply not realistic. The proposed 2018 aggregate cap for existing units is approximately 17.7 million tons. In 2015, we calculate that these existing units produced approximately 24.2 million metric tons of CO<sub>2</sub>. This means that in 2018, electric generation from these plants will be reduced by 27.7% from 2015 levels. Electric Load is expected to increase over the period 2015-2018; hence, the accumulation of OCC

metric tons per year limit for New Facilities will not even support the viable economic operation of the three New Facilities currently being built, much less any additional New Facilities. For example, Footprint Power's proposed facility, which is to come on line in June of 2017, is subject to a declining CO2 emissions cap established in settlement of litigation with CLF. The CLF Settlement annual cap limit in 2018-2020 is 2.3 million metric tons- a value that is 2.3 times the one million metric tons proposed in the Draft. The CLF Settlement states that this cap "represents the type of threshold conditions that may permit new fossil fuel infrastructure, including generating facilities, to demonstrate compliance with the GWSA, including the GWSA's 2050 mandate."

Accordingly, even if the entire one million metric ton limit for new facilities was allocated to Footprint Power, Footprint Power itself would be limited to only 43% of the operation contemplated in the CLF Settlement. A one million metric ton cap would drastically limit the operation of the Footprint Power plant which the CLF Settlement describes as an "efficient and flexible generation solution capable of supplanting less efficient, more highly polluting facilities."

Furthermore, the Massachusetts Energy Facilities Siting Board has concluded that both the Footprint Power Facility and the West Medway Facility will displace older, more highly emitting units and that such displacement would result in reduced emissions even after accounting for the units' own emissions.<sup>3</sup> However, once the Footprint Power Facility is dispatched by ISO-NE up to about a 40% capacity factor, (far less than expected given its low heat rate) it will consume the

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by existing generating units seems farfetched. Moreover, it seems incongruous to require more efficient New Facilities to acquire OCCs from less efficient facilities.

<sup>3</sup> See Footprint Power, EFSB 12-2 at Pages 31-32 and Exelon West Medway, EFSB 15-01 at Pages 61-65. The Canal 3 Siting Board Petition is pending before that agency.

entire one million metric ton New Facility Aggregate GHG Emissions Cap leaving no emissions allowance for the West Medway Facility. This would strand the West Medway facility with no ability to operate at all except through the purchase of Over Compliance Certificates, which may or may not be available on commercially reasonable terms.<sup>4</sup> Finally, in setting initial limits, any New Facility Set Aside cannot be based on a three-year look-back. Instead, we suggest, in the absence of an auction mechanism, development of an allocation based on demonstrated generator unit performance through audit and testing to demonstrate the heat rate efficiency of the equipment rather than reliance on historical data.

### **3. Over Compliance Credit Considerations**

From DEP's Draft, it appears that generators will have two avenues to comply with the carbon emissions reduction program: 1) meet the designated GHG cap, or 2) purchase OCCs. DEP should clarify the units of denomination for OCCs and how they will be purchased by market participants, as well as how they interact with the cap. In addition, DEP should clarify which entity will run the OCC registry. We expect to have more specific comments on this portion of the program when DEP publishes additional details, and we would welcome the opportunity to discuss development of this program with you and your staff.

#### **B. Unless Properly Addressed, Leakage May Undermine Efficiencies**

Electrical generation is a regional system across New England, and the use of a Massachusetts-specific emissions cap could result in a decrease in in-state emissions, but an increase in regional emissions as electric demand in Massachusetts is met with plants from elsewhere in New England. This could inadvertently advantage dirtier out-of-state generators by awarding them a price advantage for dispatch. This point is critical since, as DEP's own report

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<sup>4</sup> As discussed below, the high efficiency of the New Facilities will produce lower GHG emissions and lower electric costs to consumers.

notes, Massachusetts imports roughly 44 percent of its electricity from outside the Commonwealth. This problem, known as leakage, could cause an increase (or at least no decrease) in emissions as generation shifts from covered to uncovered emitting sources.

In order to ensure that the goals of the emissions caps are not undermined, DEP should propose how it will monitor and address leakage. Leakage under an allocation scenario presents a difficult problem, as Massachusetts cannot impose regulation on emitters outside of the Commonwealth's jurisdiction. Moreover, Massachusetts cannot discriminate against out-of-state generators or risk commerce clause challenges. This tension was seemingly addressed in the CES design by regulating the point of sale for emitters, but will be more difficult to address in a cap scenario.

### **III. Conclusion**

For the foregoing reasons, DEP should consider how best to provide equitable solutions to new and efficient generators while ensuring that leakage does not undermine the ultimate GHG reduction goals.

**From:** Jeanette Fariborz

**Sent:** Monday, November 7, 2016 8:29:38 AM (UTC-05:00) Eastern Time (US & Canada)

**To:** Strategies, Climate (DEP)

**Subject:** gas leaks in Brookline and the state

I am a resident of Brookline. I walk around my block every night and frequently smell gas. I have called to report it but no action has been taken.

I have recently learned that gas leaks account for a large percentage of the state's green house gas emissions and I am appalled that we are not getting better response on such an easily understood and applied solution to such a serious problem.

Our utility bills should not include the cost of lost gas. If the providers had to pay for lost gas and had to pay for leaks in a way that reflected their actual cost then, this problem would be addressed in a reasonable time frame. We can not afford to wait twenty years for gas lines to be upgraded.

Please address the current gas leak situation as part of the Climate Strategy for Massachusetts.

Sincerely,  
Jeanette Fariborz

**From:** Daniel Fefer

**Sent:** Thursday, November 17, 2016 11:52:50 AM (UTC-05:00) Eastern Time (US & Canada)

**To:** Strategies, Climate (DEP)

**Cc:** Dale Raczynski

**Subject:** Comment on pre-draft of 310 CMR 7.77

Dear MassDEP,

The pre-draft version of 310 CMR 7.77 contains three references to an emission threshold of “25,000 tons”. It is understood that these references may be incorrect, since the proposed rule actually applies to the set of units subject to “40 CFR 98, Subpart D” (units that report CO2 year-round in accordance with 40 CFR 75, i.e., units subject to RGGI or the Acid Rain Program, regardless of actual emissions). It is suggested for the applicability text to be updated accordingly.

Thank you,

**Daniel Fefer**

*Senior Consultant*

**Epsilon Associates, Inc.**

3 Clock Tower Place, Suite 250

Maynard, Massachusetts 01754

November 16, 2016

As the Executive Office of Energy and Environmental Affairs and the Department of Environmental Protection work to comply with Governor Baker's Executive Order 569, the Massachusetts Energy Marketers Association (MEMA) offers the following information that illustrates the significant strides the heating oil industry has made over the past 12 years in Massachusetts to improve the environmental, health and safety characteristics of the fuel delivered to nearly a million residential and commercial customers statewide. The members of MEMA voluntarily contribute to the state's efforts to reduce greenhouse gas emissions, improve heating equipment efficiency in homes and buildings, and continue to be a crucial part of the energy landscape in Massachusetts and the region.

### **About MEMA**

The Massachusetts Energy Marketers Association (MEMA), established in 1955, is a 300-member statewide organization representing every sector within the home and commercial heating oil industry including retail heating oil companies, wholesale terminal owners and operators who are responsible for bringing heating oil and diesel fuel to the Commonwealth from worldwide sources, heating and cooling equipment manufacturers and state certified oil heat service technicians.

The association is also the official overseer for allocating funds collected by the National Oilheat Research Alliance (NORA) that are spent in Massachusetts to advance industry education and training; consumer awareness and marketing of oil heat technology and renewable biofuels; advancement of energy efficiency programs, equipment and methods; and research and development on clean fuels and high efficiency equipment.

### **Cleaner Fuel**

Since 2002, MEMA has been a leader in advancing biofuel, and in particular biodiesel or biomass based diesel called Bioheat that is blended into heating oil. As far back at 2004, the association sourced funds from the NORA to conduct one of the first combustion tests on biodiesel blended with low sulfur heating oil on home heating systems in a laboratory setting at the New England Fuel Institute in Watertown, Massachusetts. Since that time, NORA and the National Biodiesel Board (NBB) have spent nearly \$7 million on advancing Bioheat in Massachusetts through technical training, research and development and direct marketing and advertising to both the retail heating oil dealer and the heating oil consumer.

Despite that in 2010 the Massachusetts Department of Energy Resources (DOER) suspended the Clean Energy Biofuels Act (Chapter 206 of the Acts of 2008), which called for incremental blends of 2-5% (B2-B5) of biodiesel in both heating oil and diesel fuel, the heating oil industry has steadily and voluntarily embraced biodiesel blends in heating oil sold statewide.

In December 2014, the heating oil industry played an integral role in securing a 20% (B20) biodiesel blend standard for heating oil from the American Society of Testing and Materials (ASTM).

In addition to these high blend Bioheat ratios, all heating oil in the Commonwealth is now rapidly transitioning to containing ultra-low sulfur content as the result of a 2014 Massachusetts Department of Environmental Protection (DEP) regulatory change (310 CMR 7.00) that received broad support from MEMA and the heating oil industry. Under the rule, all heating oil now must contain no more than 500 parts per million (ppm) of sulfur. In 2018, when the measure is fully implemented, all fuel must then contain no more 15ppm of sulfur.

According to a comprehensive report issued last year by NORA to the U.S. Congress, Bioheat blends containing as little as 2% up to 20% biodiesel with ultra-low sulfur heating oil “are lower in Greenhouse Gas Emissions (GHG) than natural gas “over their full life cycle.

A copy of this report – **Developing a Renewable Biofuel Option for the Home Heating Sector** – accompanies these written comments.

Currently, MEMA continues to work with the DOER to successfully promulgate regulations in 2017 that will further advance the use of biodiesel by providing renewable energy credits under the state’s Alternative Portfolio Standard for heating oil blended with biodiesel.

### **Energy Efficiency & Emissions Reductions**

Due primarily to the heating oil industry’s aggressive replacement of older oil-fired heating systems with newer, higher efficiency oil-fired heating equipment, homes using heating oil in Massachusetts have seen residential energy efficiency improvements of as much as 30%. Not only are these improvements substantially reducing home heating costs but they are also leading to dramatic environmental impact improvements.

### **Heating Oil & the Energy Landscape**

The heating oil industry in Massachusetts provides thousands of jobs, contributes heavily to the state’s economy, is crucial to providing energy to residential and commercial users, and is a key component in helping to produce power for electricity generation statewide.

Michael Ferrante  
Massachusetts Energy Marketers Association  
One Van de Graaff Drive, Suite 100  
Burlington, MA 01803  
Tel: 781-365-0844  
[www.massenergymarketers.org](http://www.massenergymarketers.org)



November 16, 2016

Ms. Sharon Weber  
Deputy Division Director, Air & Climate Programs  
Department of Environmental Protection  
One Winter Street 7th Floor  
Boston, MA 02108

Re: Eversource Comments on Global Warming Solutions Act Regulations

Dear Ms. Weber:

Eversource Energy Service Company (on behalf of NSTAR Electric Company dba Eversource Energy, NSTAR Gas Company dba Eversource Energy and Western Massachusetts Electric Company dba Eversource Energy (collectively “Eversource”)) submits this letter to the Massachusetts Department of Environmental Protection (MassDEP) in response to the request for comments from stakeholders on proposed Global Warming Solutions Act (GWSA) regulations.

Eversource operates New England’s largest utility system serving more than 3.6 million electric and natural gas customers in Connecticut, Massachusetts and New Hampshire. In order to meet its obligations to provide these critical services, Eversource ensures that system reliability and safety protocols are maintained in compliance with national, regional, and industry standards and policies. Eversource strives to ensure that our operations and activities are carried out in accordance with federal, state, and local environmental regulations.

#### Overall Comments

Eversource supports development of regulations that will reduce greenhouse gas (“GHG”) emissions in a meaningful way, and appreciates MassDEP’s efforts to meet the directives set out in the Kain<sup>1</sup> decision and Executive Order 569. We do have concerns, however, that the proposed emission cap regulations do not account for growth in capacity of Sulfur Hexafluoride (“SF6”) and the natural gas distribution system. This growth is critical to our ability to provide safe, reliable and cost-effective energy delivery (consistent with the goals of the GWSA).

We are also concerned with the feasibility of implementing an aggregate emissions cap for all regulated companies. An aggregate emissions cap would require sharing operational data and strategies (such as growth planning, emissions, operations, and risk management) that companies may not wish to disclose.

To provide more flexibility (especially in the area of planned growth) Eversource suggests the use of alternate compliance options to create offsets, such as the Supplemental Environmental Project (“SEP”) program. While SEPs have historically been used as a factor in penalty mitigation or as a condition of settlement, MassDEP could consider

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<sup>1</sup> Kain v. Department of Environmental Protection, 47 Mass, 278 (2016).

expanding their use beyond the context of enforcement and settlement, allowing SEP implementation as a proactive measure in achieving compliance with emissions reductions.

SEPs could provide an avenue for a company to demonstrate equivalent or greater emissions reductions when existing programs do not allow for reductions. As an example, a company could offset SF6 emissions by replacing older, higher-emitting vehicles in its fleet with electric vehicles.

Use of the SEP program in this way would serve as a model, not for settlement of an enforcement case, but rather as a mechanism to avoid non-compliance. It would allow MassDEP to reach its GWSA goals as the emissions savings from the projects can be used to meet numeric goals. It would also further MassDEP's goal to "protect public health, safety and welfare, and the environment" consistent with its Policy on Supplemental Environmental Projects, ENF-07.001.

### Comments on Proposed Sulfur Hexafluoride (SF6) Regulations

Thank you for taking the time to meet with us in October, soliciting feedback to inform draft numerical limits for SF6. As we discussed, increased demand in the Greater Boston area will require upgrades to the Eversource electric system, increasing our nameplate capacity above the proposed 5% emissions cap.

As existing substations are expanded within densely populated urban areas, space constraints become a deciding factor when determining how best to cool substation equipment. In areas where space is not a concern, equipment can be air-cooled, decreasing the amount of SF6 required. In areas with space constraints, often only gas insulated gear can be used to provide adequate cooling. In addition, we know of no industry-proven alternatives to SF6 for insulating high-voltage electrical equipment at this time. While there have been some advances in alternative insulating gases and equipment for distribution and lower-voltage transmission equipment, these are only offered by select manufacturers, are considered unproven, and are not available for higher-voltage installations.

In response to your request, Eversource submitted documentation of a greater than 150% increase in anticipated capacity by the end of 2020, mostly in the Boston area, in order to adequately serve increased demand. Please be assured that Eversource requires all new equipment to meet the 0.1% emissions leak rate for at least 5 years after installation. Information from Mitsubishi Electric is provided as an attachment to this letter.

To allow for response to increased demand, Eversource suggests the use of a cap-setting formula in the regulation that would provide flexibility. The following calculation is offered as a suggestion:

$(E(\text{in lbs}) \times \text{ALR}) + N(\text{in lbs}) \times \text{GLR}) = \text{Emissions cap for that year, where:}$

**E** = nameplate capacity of SF6 for existing equipment at the beginning of that year

**ALR** = annual leak rate for compliance year

**N** = nameplate capacity of SF6 for new equipment added during the year

**GLR** = manufacturer's guaranteed leak rate for the new equipment

Although this calculation will result in an emissions cap higher than the draft MassDEP has presented, it will adequately allow for the expansion of the system for reliability and safety by including all increased capacity in the equation. Eversource would appreciate the opportunity to demonstrate the annual emissions caps based on our growth projections.

### Methane Emissions from Natural Gas Distribution

Eversource appreciates the efforts of MassDEP and the Department of Public Utilities to include the local distribution companies in the regulatory planning process, and we support the collaborative comments on the proposed emissions regulations as provided by Keegan Werlin.

## Transportation

Eversource greatly supports MassDEP's efforts to incentivize electric vehicles for the Commonwealth's fleet as well as efforts to promote electric vehicle infrastructure. Developing a robust electric vehicle charging network will be very impactful in catalyzing deployment of electric vehicles and reaching emission reduction goals related to the transportation sector in Massachusetts.

Thank you again for providing an opportunity to comment, and considering Eversource's input on ways to allow for flexibility in achieving compliance that will not compromise our key mission to provide a safe, reliable and cost-effective energy delivery system. Should you have any comments or questions, please contact Tracy Gionfriddo, 860-665-5762.

Sincerely,

A handwritten signature in black ink, appearing to read "Catherine Finneran". The script is fluid and cursive, with the first name "Catherine" written in a larger, more prominent hand than the last name "Finneran".

Catherine Finneran

Director, Environmental Affairs

**Attachment:**

**Key Benefits Summary**

**Provided by Mitsubishi Electric**

# Key Benefits Summary

- **40+ year life design**
  - MELCO Long Experience with GIS since late 1960's.
- **Low Maintenance = Less downtime**
  - Spring operators thru 362kV.
  - Tested to high number of operations w/o maintenance.
  - Switch designs used in GIS since the 1970's.
- **SF6 gas leakage rate less than 0.1% per year**
  - This leakage rate guarantee is the best in the industry.
  - Established practices for EPA reporting.
- **Designs for Access, Safety, & Ease of Expansion**
  - Accessible viewports via platform (138kV) or camera system (245kV)
  - Strategic design of gas scheme & location of barriers.
  - Station designs with operation and expansion in mind.

## **M E M O R A N D U M**

**TO:** Massachusetts Department of Environmental Protection

**FROM:** Danvers Electric Division  
Middleborough Gas and Electric Department  
Norwood Municipal Light Department  
Reading Municipal Light Department  
Shrewsbury Electric and Cable Operations  
West Boylston Municipal Light Plant

**DATE:** April 27, 2015

**RE:** MassDEP Draft Regulation: Clean Energy Standard

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The Danvers Electric Division, Middleborough Gas and Electric Department, Norwood Municipal Light Department, Reading Municipal Light Department, Shrewsbury Electric and Cable Operations and the West Boylston Municipal Light Plant join in and support the comments submitted by the Taunton Municipal Lighting Plant ("TMLP") through its counsel, Rubin and Rudman, LLP.

The undersigned municipal light plants further note that their power portfolios currently contain the following percentages of carbon-free generation or "Clean Energy":

- Danvers Electric Division: forty eight (48%) percent
- Middleborough Gas and Electric Department: forty seven (47%) percent
- Norwood Municipal Light Department: nine (9%) percent
- Reading Municipal Light Department: twenty two (22%) percent
- Shrewsbury Electric and Cable Operations: twenty eight (28%) percent
- West Boylston Municipal Light Plant: fifty six (56%) percent

In summary, and as stated in TMLP's written comments, it is our position that MassDEP does not have the required statutory authority to promulgate a CES that would be imposed on municipal light plants. In addition, the CES obligation, as proposed, would have a substantial financial impact on municipal light plant ratepayers, totaling more than \$87 million in the first year of compliance alone. Thus, the CES would add \$100 per year to the bill of a typical residential customer using 750 kWh per month. It is further our position, as stated in TMLP's written comments, that the CES that has been proposed by MassDEP is inherently unfair to municipal light plants as it would penalize municipal light plants for their historic support of clean energy.

## **M E M O R A N D U M**

**TO:** Massachusetts Department of Environmental Protection

**FROM:** Danvers Electric Division  
Middleborough Gas and Electric Department  
Norwood Municipal Light Department  
Reading Municipal Light Department  
West Boylston Municipal Light Plant

**DATE:** November 21, 2016

**RE:** Applicability or Proposed Clean Energy Standard to Municipal Light Plants

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The Danvers Electric Division, Middleborough Gas and Electric Department, Norwood Municipal Light Department, Reading Municipal Light Department, and the West Boylston Municipal Light Plant join in and support the comments submitted by the Taunton Municipal Lighting Plant ("TMLP") through its counsel, Rubin and Rudman, LLP.

In summary, and as stated in TMLP's written comments, it is our position that municipal light plants, particularly those that have not opened up their service territories to retail competition, should not be subject to a mandatory CES obligation. Rather, consistent with the existing statutory and regulatory scheme, municipal light plants, should continue to have flexibility to structure their own clean energy programs based on their individual needs and resources. Please refer to the April 27, 2015 memorandum (attached hereto) for information regarding the amount of carbon-free generation or "Clean Energy" in our power portfolios.

# **WEST BOYLSTON MUNICIPAL LIGHTING PLANT**

4 Crescent Street, West Boylston, Massachusetts 01583  
Telephone (508) 835-3681 Fax (508) 835-2952

Delivered by Email

November 21, 2016

Massachusetts Department of Environmental Protection  
One Winter Street  
Boston, MA 02108

Subject: MassDEP Clean Energy Standard

Dear MassDEP,

On behalf of the 3,552 stakeholders and owners of West Boylston's municipal light department (WBMLP), thank you for the opportunity to submit comments related to the Massachusetts Department of Environmental Protection (MassDEP) proposal to implement a Clean Energy Standard (CES) in the Commonwealth. WBMLP appreciates the Commonwealth's clean energy goals and efforts to address the challenges of greenhouse gas emissions (GHG) and climate change through the Massachusetts Global Warming Solutions Act (GWSA).

WBMLP's ratepayers are extremely proud of their contribution towards reducing greenhouse gas (GHG) emissions through its; long-term renewable power supply strategy, existing non-GHG emitting generation assets, and, funding of energy efficiency and conservation programs in our service territory. The Commonwealth's "energy generation and distribution sector" reduced GHG emissions 48% by the end of 2014 compared to the 1990 baseline. Our sectors GHG emission reductions exceed expectations and the progress made to date by any other sector. WBMLP's power supply as a percentage of sales was 49% non-GHG emitting in 2015 based on our most recent MassDEP BWP AQ31 submittal. MassDEP's most recently published annual GHG Summary Report for 2013 indicates WBMLP had 50.1% of sales reported as non-emitting MWh's. Compare this to the (3) Investor Owned Utilities (IOU) reporting between 6.2% - 7.3% of sales reported as non-emitting MWh's in 2013. WBMLP already meets a CES through its own regulatory process and will continue to develop and/or purchase both renewable and clean energy generation given our unique structure and legislative authority.

## **Statutory Authority of Light Board's to Regulate MLPs**

WBMLP is regulated by locally elected or appointed Boards and our consumers directly participate in the MLP decision making process. MLPs operate under a completely different business model than IOUs. Because of our unique business model and governance by the ratepayers we serve, MLPs have been excluded from all previous legislation directed at the Commonwealth's IOUs including; 1997 Legislation to Restructure the Electric Utility Industry,



2002 Renewable Energy Portfolio Standard for Retail Electricity Suppliers, and the 2008 Green Communities Act.

Ratepayer and local control of MLPs typically results in lower electricity rates, significant investment in renewable/clean energy projects, and, the ability to invest in new cost effective energy technologies faster than any other entities. By the end of 2015, WBMLP already owned 1.87 MW's of solar, 1.9 MW's of wind, 2.7 MW's of nuclear, and over 0.7 MW's of hydro-electric generation through both ownership and purchase power agreements (PPA). Almost half of our power portfolio emits zero GHG's and again, our ratepayers are extremely proud of our contribution towards reducing GHG emissions through our clean power supply, diverse power portfolio, and funding of energy efficiency and conservation programs in our service territory.

### **Global Warming Solutions Act**

The Global Warming Solutions ACT (GWSA) does not specifically include MLPs in a CES standard and therefore, MassDEP's does not have the authority to propose CES regulations on MLPs. As already mentioned, MLPs are regulated by elected Light Board's directly representing its consumers. MLPs were not included in the stakeholder process or represented on the advisory committee established by Chapter 21N, Section 8 of the GWSA. The GWSA established an advisory committee to the executive office in overseeing GHG reduction measures. The advisory committee consists of representatives from all sectors impacted by the new law and MLPs were not specifically included in the GWSA committee stakeholder process. WBMLP should not be included in the CES standard because MLPs were not represented on the advisory committee, invited to participate in the original stakeholder process, and, the GWSA does not specifically authorize MassDEP to regulate MLPs through a CES standard.

The GWSA requires the Secretary of Energy and Environmental Affairs to "evaluate the total potential costs and economic and noneconomic benefits of various reduction measures to the economy, environment and public health, using the best available economic models, emissions estimation techniques and other scientific methods". There has never been an economic analysis that determines the impact a CES would have on specific MLP ratepayers, especially if existing zero GHG emitting resources such as our imported hydroelectricity and nuclear generation were excluded. The only analysis completed and referenced in the CECP calculates the cost impact on IOU ratepayers. This supports our position that MLPs were not intended to be included in a CES and if they are considered, WBMLP requests a detailed economic analysis on the cost impact to our specific ratepayers in West Boylston.

The Clean Energy Performance Standards (CPS) on pages 47-48 of the original CECP state; "In the near-term, a CPS is likely to have a limited impact on electricity prices for consumers." The footnoted document for this statement is; "Environmental and Technology Policies for Climate Mitigation" written by Carolyn Fischer and Richard G. Newell. This GHG economic policy model is based on nation-wide electricity generation data from the Energy

Information Administration (EIA 2006). The model utilizes a baseline fuel mix of 55% coal, 16% natural gas, 3% renewables, and 26% nuclear & hydro for energy production. These critical inputs to the economic policy model do not reflect the actual fuels used to generate electricity in Massachusetts or the ISO-NE control area. The percentages of fuels used in energy production in Massachusetts or the ISO-NE control area are completely different than the model baseline used to support the claim of limited impact on consumer cost.

All Commonwealth ratepayers deserve an accurate economic analysis of the potential rate increases the CES will create if implemented based on our state's most current and reasonably forecasted generation fuel mix. Before new CES regulations are approved, MassDEP should prepare an economic policy model and consumer cost impact study based on the actual, most current, sources of fuel for energy production specific to Massachusetts. All consumers have a right to know the cost impact of any new regulation proposed by MassDEP.

### **MA Clean Energy and Climate Plan for 2020**

Both the original and updated MA Clean Energy and Climate Plan for 2020 (CECP) were created with input from the GWSA advisory committee. Advisory committee members directly participated in the stakeholder discussions that created the draft CES regulations included in the CECP. MLPs did not participate as either a committee member or as stakeholders in the creation of the draft CES regulations. MLP exclusion from the CECP stakeholder process supports our position that MLPs were never intended to be included in a CES.

### **WBMLPs Long-Term and Diverse Energy Portfolio**

WBMLP is contractually obligated to purchase 80-90% of our annual energy supply requirements through various long-term power purchase agreements (PPA) and power supply agreements (PSA). WBMLPs long-term energy portfolio includes a diverse mix of renewable, cost effective, and clean energy supply obligations that extend beyond 2040. Only 10-20% of our annual energy supply is considered "open" and this amount is typically fulfilled through ISO-NE day-ahead and real-time energy market purchases.

Our ratepayer/owners expect this long-term planning to maintain the lowest cost, cleanest supply, and most stable electricity rates. It is not feasible to impose CES regulations on MLPs that have long-term power supply contracts, or, to exclude our existing low and zero GHG emitting generation assets from a CES program. Approximately 49% of our current energy supply is considered zero GHG emitting and by 2030 this amount could increase once our renewable energy projects are paid for. If a court determines MassDEP regulations apply to MLPs, and CES regulations exclude existing clean energy generation, WBMLP would have to either buy additional CES qualified energy or make alternative compliance payments. Either option will significantly increase the cost of electricity to our consumers. This economic analysis has not been completed as required by the GWSA.

## **Imported Hydroelectricity from New York**

MLPs were the first utilities to import low-cost, clean renewable hydroelectricity into our ISO-NE region for the benefit of our ratepayers. WBMLP, through its joint action agency MMWEC, purchases and receives inexpensive hydroelectric power from the New York Power Authority (NYPA). All 40 municipal light plants in Massachusetts import and proportionally share 53 megawatts from the Niagara Hydroelectric Project in New York. WBMLP receives approximately 4-5% of this zero GHG emitting, renewable energy from NYPA. As the Commonwealth considers a plan for IOU to purchase and import hydroelectricity from Canada, MLPs like West Boylston, have already done so since 1985 through contracts we negotiated and aggressively preserve on behalf of our ratepayer/owners. This existing imported hydroelectricity counts towards our locally governed renewable and clean energy portfolio and it should qualify under MassDEP's CES.

## **Nuclear Projects.**

Nuclear power is a critical component of our state's clean energy portfolio. Participating MLPs are the only entities that receive their proportional ownership share of energy from the various nuclear projects in New England. Our ratepayers paid for the development, project debt, and safe operation of these plants, and presently, these assets generate some of the lowest cost energy on behalf of our stakeholders. The environmental attributes are just now being realized as this source of power emits zero GHG's and is extremely reliable. If a CES is successfully imposed on MLPs, our ratepayers should receive CES credit for owning this existing non-GHG emitting power supply.

## **Conclusion**

On behalf of WBMLPs ratepayers, local control through Public Power, and for the reasons outlined in this letter, please considering our concerns and requests regarding the proposed CES.

Sincerely,

Board of Light Commissioners  
Winthrop Handy, William Smith, and Anthony Meola



# CALPINE CORPORATION

NYSE CPN

Submitted via email to [climate.strategies@state.ma.us](mailto:climate.strategies@state.ma.us)

Calpine Corporation ("Calpine") appreciates the opportunity to comment on MassDEP's stakeholder discussion draft 310 CMR 7.77, *Reducing Greenhouse Gas ("GHG") Emissions From Electricity Generating Facilities Program*. In addition to these company-specific comments, Calpine also generally endorses the New England Power Generators Association's comments provided to MassDEP on November 18.

Calpine operates the largest fleet of natural gas combined-cycle ("NGCC") and combined heat and power facilities in the U.S. Calpine is also the nation's largest producer of electricity from renewable, base-load geothermal resources. Overall, Calpine is capable of delivering nearly 27,000 megawatts ("MW") of clean, reliable electricity to customers and communities in 20 U.S. states and Canada, with 82 power plants in operation or under construction.

In the Regional Greenhouse Gas Initiative ("RGGI") states, Calpine owns approximately 3,900 MW of operating capacity. In Massachusetts, Calpine owns the Fore River Energy Center, a 731 MW dual-fuel natural gas combined-cycle plant in North Weymouth. Calpine also owns two additional NGCC plants in New England: the 695 MW Granite Ridge Energy Center in New Hampshire and the 552 MW Westbrook Energy Center in Maine.

Calpine has been constructively engaged at the Federal and State levels on climate change policy and programs for over a decade. Calpine has a history of engagement with Massachusetts and other RGGI member states since the inception of the RGGI program, including active participation in the 2012 and current 2016 Program Review. We have long advocated for policies that support both environmental stewardship and fair and free competitive markets.

We applaud Massachusetts for its leadership in RGGI, which has demonstrated that use of a mass-based carbon reduction program with interstate trading is a cost-effective and economically viable way to reduce carbon emissions. Our perspective on climate policy follows that framework, which includes the following tenets:

- A carbon emissions reduction program should place a clear price on carbon emissions in a way that allows such a price to be reflected in wholesale power prices. This will effectively align economic and environmental incentives such that market forces drive the desired outcomes.
- Programs should be designed and administered in a way that minimizes market distortions. This includes:
  - Broad coverage of power generation facilities that emit greenhouse gases, including both new and existing sources;
  - Effective and equitable methods for distributing emission allowances or similar instruments; and



- Minimization of "seams" issues that result from differing requirements from one state to the next. This is particularly important because competitive power markets, such as those operated by ISO-New England ("ISO-NE"), typically span multiple states and are often not defined by state administrative boundaries.

### **Calpine Has Significant Concerns with the Proposed Approach of the Regulations**

Calpine is deeply concerned about the approach outlined by MassDEP's stakeholder discussion draft 310 CMR 7.77, *Reducing Greenhouse Gas (GHG) Emissions From Electricity Generating Facilities Program*. Calpine strongly believes that hard caps on existing and new facilities would increase wholesale market prices, impose costs and environmental burdens on neighboring states, which will likely lead to increased emissions in those states, and at the same time, put Massachusetts generators in the position of choosing between noncompliance with environmental regulations and nonperformance with its binding obligation to the power grid.

It is Calpine's view that MassDEP is not obligated to impose hard caps on the entire electric sector. Nevertheless, if MassDEP moves to propose these rules, at a minimum Calpine recommends that the rules only apply through December 31, 2020 in order to achieve state greenhouse gas mandates through 2020.

Because of a number of uncertainties that will affect the greenhouse gas reduction trajectory in the state after 2020, MassDEP should establish a sunset date of December 31, 2020 for these regulations, and evaluate the regulatory and investment decisions that will continue to evolve during this time. For example, Massachusetts has already undertaken large-scale initiatives to reduce power sector emissions via end use energy efficiency and distributed solar, and now has a legislative mandate to initiate the procurement of a significant amount of renewable resources via long-term contracts. Massachusetts is also continuing to participate in RGGI.

These efforts have reduced, and will continue to reduce, carbon emissions across the New England footprint, including Massachusetts. The reduction in emissions from fossil fuel-fired resources in New England is indeed likely to accelerate over time as new zero-carbon resources come on line. These resources will inevitably displace generation from fossil units because they will be able to compete in the ISO-NE wholesale power market at zero cost, since their financing is based on long-term contracts.

At the same time, it is difficult to see how the region could withstand a 2.5 percent per year reduction in power generation from so much of the region's fleet *without* having replacement energy available. However, and as MassDEP is no doubt aware, because the pending multi-state Clean Energy RFP is on hold due to a temporary injunction granted by the United States Court of Appeals for the Second Circuit, the timing and size of the pending wind and hydro procurements will not be known until the Second Circuit lifts the stay, RFPs are issued next year, bidders are selected, contracts are executed, and individual projects receive applicable state and federal regulatory approvals. Thus, for purposes of efficiency and prudence, Calpine urges the MassDEP to initiate a separate rulemaking process, on a longer timeframe, to determine the best approach for post-2020 compliance once we have a better understanding of the likely timing and scope of large-scale renewables development.

Calpine also respectfully requests that MassDEP give careful consideration to the following issues as it moves forward through the rulemaking process.

*MassDEP's Proposal is Not Required by the Supreme Judicial Court's Decision or the Governor's Executive Order*



The May 17, 2016 Supreme Judicial Court ruling mandated that MassDEP promulgate regulations “that establish volumetric limits on multiple greenhouse gas emissions sources, expressed in carbon dioxide equivalents, and that such limits must decline on an annual basis.” While the ruling indicated that RGGI did not ensure greenhouse gas emissions reductions in the Commonwealth, and as such could not be counted towards compliance under §3 (d), it also noted “the Legislature's intent that regulations related to the electric sector be treated differently from regulations promulgated under §3 (d).” Thus, Calpine does not believe that the decision obligates MassDEP to impose a hard cap on the entire electric sector.

In addition, Governor Charlie Baker’s Executive Order No. 569, *Establishing an Integrated Climate Change Strategy for the Commonwealth*, directs MassDEP to “consider limits on emissions from, among other sources or categories of sources, the following: (i) leaks from the natural gas distribution system; (ii) new, expanded, or renewed emissions permits or approvals; (iii) the transportation sector or subsets of the transportation sector, including the Commonwealth’s vehicle fleet; and (iv) gas insulated switchgear”. Nowhere does Executive Order No. 569 direct MassDEP to establish greenhouse gas emissions caps for all electricity generating facilities in the Commonwealth.

*MassDEP’s Proposal Will Not Reduce Regional Greenhouse Gas Emissions, and Could Increase Them*

MassDEP’s proposed approach runs counter to achieving cost effective greenhouse gas emission reductions from the electric generating sector. A specified annual reduction in CO<sub>2</sub> emissions against a hard cap can only be accomplished by reducing energy production from fossil-fueled generators. These facilities have no other way to reduce carbon emissions and will not be able to comply via interstate trading, which Massachusetts has consistently supported as the preferred approach to address climate change through the most cost-effective investment decisions.

Given the retirement and pending retirement of various resources, combined with the fact that natural gas is the lowest cost fuel in the energy mix, the NGCC fleet has now evolved to become the backbone of the region’s power supply. NGCC technology is the most energy efficient and cleanest fossil generating capacity on the grid. Importantly, by 2018, a disproportionately large percentage of New England’s NGCC fleet (approximately 45%) will be located in the Commonwealth.

Any mandatory curtailment of energy production at these facilities will inevitably shift emissions to less efficient generating facilities in other states that will likely have higher carbon intensities. In fact, if this regulation is promulgated, greenhouse gas emissions will likely *increase* in other states in New England, thus potentially offsetting Massachusetts’ other efforts under the GWSA. Shifting emissions to facilities in neighboring states is not good environmental policy. MassDEP should fully assess these implications, especially given that other states in New England have their own economy-wide greenhouse gas reduction goals.

Power generators can and will deliver the environmental outcomes desired, at the lowest possible cost, through appropriately-designed competitive power and emission trading markets. Thus far, the New England power sector has delivered dramatic environmental benefits via market forces – specifically, via RGGI compliance combined with the price-driven retirement of virtually all of the region’s coal fleet and the modernization of the natural gas fleet. Because of this success, MassDEP should focus on transportation and other sectors for the next tranche of cost-effective carbon reductions. For the power sector, using RGGI with an appropriate level of stringency is the most effective way to drive the desired outcomes.

Moreover, the interconnected nature of the electric grid makes it particularly ill-suited to the application of § 3(d). To force it into the GWSA § 3(d) program would be to interrupt the cost-effective



and reliability-supportive operation of the regional power system. Rather than subjecting all Massachusetts electric generators to GWSA § 3(d), MassDEP should continue to approach greenhouse gas emission reductions from the electricity sector under GWSA § 3(c).

RGGI continues to be the most flexible, most cost-effective and most efficient mechanism to address power sector carbon emissions in the Northeast. As noted in its RGGI stakeholder comments, Calpine would support RGGI moving to a tighter cap that would result in higher, and therefore more effective, allowance pricing to reduce electric sector emissions in the Commonwealth along with complementary measures such as energy efficiency and renewable energy. We urge MassDEP to continue its strong leadership in RGGI and advocate for a post 2020 RGGI cap that is in line with the GWSA's long-term goals.

#### *MassDEP's Proposal Would Potentially Impose a Significant Reliability Risk to the Region's Power Grid*

There is a fundamental conflict between MassDEP's proposed approach and the performance obligations generators face under ISO-NE tariff requirements, which are in turn subject to review, approval and enforcement action by the U.S. Federal Energy Regulatory Commission ("FERC"). Generators have a legally binding and enforceable obligation to operate their facilities per ISO-NE dispatch instructions. Generators that fail to perform pursuant to ISO-NE rules face harsh penalties and possible referral to FERC for potential enforcement action. If enacted, the proposed approach would place generators in an untenable position, having to decide whether to comply with a state environmental mandate or their long-standing ISO-NE tariff and Federal Power Act requirements. This could easily occur during a year when the fossil fleet experiences higher-than-average operating hours due to a combination of severe seasonal weather, a forced outage at a large generator, or other factors that severely reduce or eliminate the availability of carbon credits toward the end of a compliance year.

In summary, there are no legal, economic, or environmental policy reasons militating MassDEP to proceed with the draft 310 CMR 7.77, *Reducing Greenhouse Gas (GHG) Emissions From Electricity Generating Facilities Program*. In fact, economic and environmental considerations suggest that this proposal is counterproductive. Absent a legal mandate, MassDEP should not proceed with 310 CMR 7.77 as proposed.

#### **Certain Revisions Are Necessary if the Proposed 310 CMR 7.77 Proceeds**

Notwithstanding the foregoing, if MassDEP were to move forward with these regulations, Calpine recommends the following revisions to minimize the potential market distortions that will likely occur as a result of the regulations. The following includes recommendations that are essential to minimize the potential market distortions the draft approach could cause. However, it is important to note that even with the changes discussed below, the rule will impose significant risks on electricity consumers and are not likely to reduce actual regional greenhouse gas emissions.

#### *Process for Determining Facility-Specific Caps*

According to the MassDEP methodology, the 2018 facility caps for existing facilities would be approximately 5 percent less than average 2013 to 2015 emissions, after adjusting for reductions from coal plant retirements and potential new facility caps. In 2015, emissions in Massachusetts were 11.1 MMT (8.49 MMT without Brayton Point). Therefore, the 2018 cap would be a 4 percent reduction statewide in just three years, even before the 2.5 percent annual reduction in subsequent years.

The 2018 facility cap would impose an immediate operational constraint on Calpine's Fore River facility, which would only become more severe as its facility-specific cap is reduced annually. Unlike



other facility owners and operators in the Commonwealth, Calpine only owns one facility, and therefore, would be unable to comply by leveraging multiple facilities. Instead, Calpine would have to either reduce operations or acquire over compliance credits (OCCs) from other facility owners. However, there is no guarantee that OCCs will be available at all, much less at a price that make it possible for Fore River to continue to generate economically.

As a way to address this problem, rather than setting existing facility caps once, if this program is not sunset at the end of 2020, MassDEP should consider updating or recalibrating caps every three years. This would address facilities that are dispatched less and reduce the likelihood that marginally economic facilities with low capacity factors would be able to remain in the fleet to keep their OCCs in a portfolio. Finally, facilities that retire should be able to keep their OCCs until the next recalibration.

#### *Over-Compliance Credit Mechanism and Compliance*

Since this program is based only on deviations above or below the cap, rather than allowances for all emissions, facilities will demonstrate compliance with the cap either by emitting less than their cap or by submitting OCCs. With the market short by 4 percent beginning in 2018 compared to 2015 emissions, OCCs are certain to be scarce, and generators holding OCCs may or may not be interested in selling them. Establishing annual compliance periods would only compound this scarcity by constraining the time to comply, given the continued reductions in the aggregate and facility caps beyond 2020. This would magnify the shortage, which in turn would encourage facilities to bank and hold OCCs for potential future use rather than trade them with others.

The discussion draft also directs MassDEP to create OCCs for unassigned new facility caps by May 1, 2019 and annually thereafter. Calpine requests clarification of whether a facility owner will be able to use the entire new facility cap for the first three years (2.925 MMT) to create OCCs that would then be deposited into existing facility registry accounts in proportion to their greenhouse gas emissions caps.

As noted above, Calpine is concerned with an annual compliance requirement. In addition to recalibrating the caps every three years, MassDEP should consider aligning the program with the RGGI three-year compliance period (2018-2020) rather than an annual compliance demonstration. While Calpine strongly believes that hard caps should be avoided, if caps are imposed, MassDEP should compute the declining cap at 2.5 percent per year but then make that an average cap over three years. This approach would better account for variability in generation due to weather patterns or some other unforeseen shutdown or energy shortage. Mass DEP should also consider provisions to address extreme weather events or major outages where emissions could be borrowed from the future or from an emergency OCC pool. Furthermore, it is imperative that any final regulations issued by MassDEP clearly authorize generators to operate in times of power system emergencies in order to maintain grid reliability.

Finally, the timing for compliance is problematic as there is very little time to establish availability and price of OCC's, in addition to a real risk of OCC hoarding by facility owners. According to the timeline provided in the discussion draft, facility owners or operators would only have approximately one month to acquire OCCs if needed for compliance. The reporting and compliance deadlines provided in the discussion draft are as follows: by April 15, 2019, report greenhouse gas emissions from the previous calendar year; by May 1, 2019, certify the number of OCCs created in the previous calendar year; and by June 15, 2019, submit a compliance certification for the previous calendar year's emission cap. These timelines do not provide MassDEP with adequate time to process applications for the creation of OCCs. MassDEP should issue OCCs as early as feasible once it has



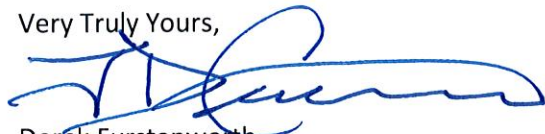
verified greenhouse gas emissions reports from facility owners or operators. The very tight timeline noted above is idealized, and does not take into account the administrative process.

### **Conclusion**

Calpine appreciates the opportunity to provide input on MassDEP's stakeholder discussion draft 310 CMR 7.77. As noted above, we believe hard emission caps are unnecessary, would lead to even higher region-wide power sector emissions, and could have numerous and significant unintended consequences for the New England power supply system. However, if MassDEP moves forward with this approach, the regulations should sunset by December 31, 2020, and MassDEP can initiate a separate rulemaking process to evaluate what may be needed and how best to design a program to capture electric sector reductions post 2020.

We look forward to continuing to work MassDEP in this process. Please do not hesitate to contact me at [derek.furstenwerth@calpine.com](mailto:derek.furstenwerth@calpine.com) or 713.315.9357 if you have any questions or need additional information.

Very Truly Yours,



Derek Furstenwerth  
Senior Director, Environmental Services  
Calpine Corporation

Commissioner Martin Suuberg  
Department of Environmental Protection  
One Winter Street  
Boston, MA 02108

Re: Compliance under the Global Warming Solutions Act (GWSA)

Dear Commissioner Suuberg:

The Climate Action Business Association (CABA) thanks the Department of Environmental Protection for the opportunity to comment on Massachusetts' regulations on reducing greenhouse gas emissions under the Global Warming Solutions Act (GWSA). CABA's mission is to solve the climate crisis by organizing local business leaders to be more effective advocates for climate change action within our communities, and in their business. CABA works with hundreds of businesses in our networks and partner organizations who are concerned about the impact of climate change on the Commonwealth and the integrity of GWSA requirements.

We commend the Department for valuing stakeholder input in considering alternative mechanisms to meet the emissions reductions mandated in the GWSA. Although CABA is highly supportive of the Department's policies, we are concerned that some current and proposed policies may not be effective for the Department to reach its goals in 2020 and beyond. There is no discretion: the 2020 mandate must be met. If we miss the 2020 requirement, there will be little to hold future administrations accountable. CABA offers the following comments to DEP as it considers implementing expanded policies for greenhouse gas emissions reductions:

**Higher rates of renewable energy deployment:** Construction of transmission lines and infrastructure for renewable projects is unlikely to be achieved by 2020 and bring in the predicted number of clean energy imports. Increasing the Renewable Portfolio Standards (RPS) or implementing a Clean Energy Standard (CES) would increase the deployment of renewable energy on a short-term timeline. CABA would prefer to see an increase in the RPS percentage requirement for Class I sources, but would accept a CES so long as the qualifications are not less stringent than the RPS qualifications. CABA agrees that the qualifications should allow only for new sources, following the RPS qualifications. Inclusion of municipal light plants will increase the deployment of renewables in the state while allowing prices to both decrease and stabilize.

**Increasing commitment to energy efficiency for commercial customers:** Our state's energy efficiency programs could yield more successes if electric and gas utilities worked harder to

expand adoption of efficiency measures for commercial customers. Utilities do not pursue all cost-effective efficiency because they do not receive as high of a return on it than they do for large capital investments.

Since 2010, utility companies have underspent and underperformed in the commercial and industrial sector, despite the fact that energy efficiency is the least expensive resource available. Savings in the commercial sector have stayed below its goal, while the cost per kilowatt hour to achieve the savings have remained low enough to make it cost-effective. The commercial and industry sectors use more electricity than the residential sector, making it a significant portion of the plan's goal for savings. Given that energy efficiency is a key strategy in Massachusetts's plans to meet GWSA mandates, why not make use of the most cost-effective resource we have.

**Transportation sector:** Massachusetts has been a forerunner in emissions reductions for the electricity sector. The state's plan to purchase hybrid and electric automobiles for the state vehicle fleet will only reduce greenhouse gas emissions by less than 0.01%. Given that transportation is now the largest contributor of greenhouse gas emissions in Massachusetts, CABA encourages the Department to look beyond existing regulations and the state vehicle fleet to make meaningful sector emissions reductions.

**Carbon pollution fee-and-rebate:** Economists and scientists across the globe agree that internalizing the external costs associated with carbon pollution, by adding a pollution fee to the price of fossil fuels and other sources of GHG emissions, is the most cost-effective means of cutting GHG emissions. Using a market-based mechanism to cut emissions provides price and market certainty to the commercial and industrial sectors, an important component of ensuring economy-wide reductions. Though this policy may not enable us to meet 2020 requirements on its own, it is the most effective policy we have on the menu to keep us on track to meet requirements down the road.

Thank you for the opportunity to comment on efforts to reduce greenhouse gas emissions in the Commonwealth. We thank the Department for its hard work and look forward to taking part in the process moving forward. If you have questions about these comments, please contact me at [Kate.Galbo@cabaus.org](mailto:Kate.Galbo@cabaus.org).

Sincerely,

Kate Galbo  
Policy Coordinator  
Climate Action Business Association

**Testimony**  
**to**  
**Department of Environmental Protection (MassDEP)**  
**Regarding**  
**Reducing Emissions Under M.G.L. c. 21N §3(d)**

Jan Galkowski

*Westwood Statistical Studios<sup>1</sup>*  
*jan@westwood-statistical-studios.org*  
*empirical\_bayesian@ieee.org*  
*bayesianlogic.1@gmail.com*

*2<sup>nd</sup> November 2016*  
*post-final revision*

<sup>1</sup> 320 Dover Road, Westwood, MA 02090-2414

### *Acknowledgements*

I thank Eleanor Rosellini and Paul Lauenstein for careful readings and criticism. Special thanks to Emily Kirkland of *MA Power Forward* for alerting me to the opportunity to testify and inviting me to do so.

# 1 Executive Summary and Verbal Testimony

Thank you for this opportunity to testify regarding the Global Warming Solutions Act (“GWSA”) and the roles of MassDEP and EER.

I would like to make three points, and I will leave further details and documentation to the written version of my testimony.

1. **Measure** emissions, don’t merely accumulate self-reported numbers and project trends.
2. Compliance with GWSA is a large challenge for the Commonwealth. Its management and administration *deserves* additional people and additional funding. The Department and its allied teams in DPU and DOER should propose such in the next budget cycle.
3. Use the markets, and stop getting in their way when they can help achieve the purposes of the GWSA.

On the first point, the 2020 Plan for implementing GWSA as recently clarified by the Supreme Judicial Court continues to only make sense if only *goals* were being pursued, but not *limits*. I mean these terms narrowly, in the manner they were used in the SJC case. To assure *annual* reductions in emissions, assessments of their point-in-time volumes must necessarily take much less than a year to complete. I urge the Department to pursue a campaign of *scientifically monitoring emissions* independently of its established system of *reporting*, even if such reports are based upon ANSI standards. Language to support such *monitoring* activities is in the GWSA itself and in the SJC’s decision. There are several ways this can be done, which I have detailed in my written statement. For example, such a system is in place in California, operated by that state’s EPA and its Air Resources Board. **Such measurement is *cheaper* than onerous life cycle inventories of greenhouse gas emissions and reporting.**

On the second point, compliance with GWSA limits is a big job. It is bigger than compliance with mercury reduction two decades ago, when the MassDEP staff was double what it is presently. The legislature cannot seriously expect such enforcement without providing adequate staffing and funding to the Department and its allied teams, DPU and DOER. This administration can begin by proposing additional staff in its budget. The means by which these

funds are raised might help nudge us collectively towards the GWSA's limits. Staff can be thinned as GWSA limits are met.

On the third point, in my opinion, the legislature and the administration are indirectly making the achievement of GWSA limits more difficult. By leaving and sometimes creating obstacles in the way of the markets and technological innovators, they are costing the Department and the Commonwealth more time and treasure than otherwise would be needed to achieve GWSA limits. I speak of the energy revolution which attends the dramatic improvements exemplified by the *experience curves* for solar PV and storage. While administration and legislature have done much to introduce the Commonwealth to these technologies, and they should be thanked for their efforts, they also support and introduce roadblocks, such as caps on incentivized participation. These impede free market competitive challenges and aggressive innovation, primarily by small companies. The road to the 2050 GWSA limits is made all the much harder by equivocating about how we can continue to use fossil fuels and still decarbonize. No company has the early retirement of their fossil fuel infrastructure on their depreciation schedules.

Thank you for listening.

## 2 Written Testimony

Thank you for this opportunity to testify regarding the Global Warming Solutions Act (“GWSA”) and the roles of MassDEP and EER.

### 2.1 Measure, not merely *project*

From a quantitative perspective, the agencies’ plans for complying with the GWSA as interpreted by the recent Supreme Judicial Court (“SJC”, or “Court”) decision<sup>1</sup> is currently exposed to four statistical challenges:

- *Underreporting* of emissions<sup>2</sup> aligns with achieving a 2030 (or 2030, or 2050) limit. That is, error in assessment helps achieve limits, complicating compliance, disincentivizing accuracy, and introducing biases<sup>3</sup>, even if enforcement of reporting is assumed to be perfect. The Massachusetts GHG Reporting Registry omits counts of major sources of emissions, such as vehicular transport and buildings<sup>4</sup>.
- Assuring *annual* reductions in emissions demands emissions be assessed that takes appreciably less than a year to complete. Once status is observed, it must be converted to policy and implemented. Lags between steps are unavoidable. Large point source emissions are reported annually through the GHG Registry, but building and transport emissions are not.
- Uncertainties and variations in measurements are intrinsic, not imperfections. Because measurements are subject to forcings beyond the Department’s control does not mean these forcings are not real, or that the resulting emissions do not or ought not count against a limit. Determining a principled<sup>5</sup> way of deciding which estimate<sup>6</sup> from data should be compared against a planned limit is implicitly part of the Department’s charge.

<sup>1</sup>Specifically, *Isabel Kain & others I vs. Department of Environmental Protection*, **SJC-11961**, May 17, 2016.

<sup>2</sup>Methane emissions are known to be systematically underreported, even if unintentional. See A. L. Rice, *et al*, “Atmospheric methane isotopic record favors fossil sources flat in 1980s and 1990s with recent increase”, *Proceedings of the National Academy of Sciences*, 2016, and S. Schwietzke, *et al*, “Upward revision of global fossil fuel methane emissions based on isotope database”, *Nature*, **538**, 6 October 2016. This kind of phenomenon does not only affect emissions data. The United States has two measures of homicide data, the Bureau of Justice Statistics’ Supplementary Homicide Reports, and the Fatal Injury Reports from the National Center for Health Statistics. The former are based upon voluntary reporting from police agencies and the latter comes from county pathologists. The former underreports the latter by as much as 10%.

<sup>3</sup>The true number is always higher than that observed.

<sup>4</sup>These are categories reported in, for instance, the 2013 edition of the *Commonwealth of Massachusetts Global Warming Solutions Act 5-Year Progress Report*.

<sup>5</sup>And statistically sound.

<sup>6</sup>Median, mean, a filtered smooth, etc, with interquartile ranges, standard deviations, or other bounds describing variability.



- Weather uncertainties may impact behavior, but they also impact need for, say, heating energy<sup>7</sup> The Department's charge also includes a principled way of adjusting for such effects, or declaring Massachusetts must meet limits *despite weather*.
- When collecting information from systems, it is always a better sampling design to align the goals of collection *with* human nature, not fight it. Automated collection emissions data is the best. If onerous procedures for recording emissions are necessary, then it is good to have cross-checks upon their results, such as are available with independent measurements.

*Limits*<sup>8</sup> are bounds and barriers to be met or missed. They are not *aspirational goals*. Without frequent intermediate assessments, missing a 2020 limit will make complying with a 2030 one harder. It might make meeting the 2050 impossible. If the Department assessed the Commonwealth's state of emissions at least once a year, corroborating its combined reports of emissions at sources with scientific assays using arrays of sensors, it could conceivably control those emissions on a trajectory like the SJC requires<sup>9</sup>. Such scientific and engineering means of monitoring atmospheric CO<sub>2</sub> and other forms of *short-lived climate pollution* (hereafter "SLCP"<sup>10</sup>) have been available for decades, and have improved in accuracy and cost. While periodic aircraft surveys are popular with NASA and NOAA<sup>11</sup>, it is also possible to erect a system of semi-permanent towers<sup>12</sup> which either capture flasks of air for laboratory analysis<sup>13</sup>, or, with more expensive equipment but lower recurring costs, to use LIDAR to assess gaseous atmospheric constituents along established paths<sup>14</sup>. Even drone-mounted instruments have been proposed by scientists at Princeton and the University of Texas<sup>15</sup>.

Judicious location of such towers<sup>16</sup> along with ancillary records of prevailing wind and precipitation would be used to *back out* CO<sub>2</sub> and SLCPs which originate outside the Commonwealth<sup>17</sup>.

The Supreme Judicial Court ("SJC", or "Court") decision may have implied such an approach. While the Court argued<sup>18</sup> the Department had its choice of suitable sources, they declared

<sup>7</sup>For example, energy usage is often calibrated for customers in terms of *degree days*.

<sup>8</sup>My use of the terms *limit* and *goal* or, more completely, *aspirational goal*, are taken from the language of the SJC decision.

<sup>9</sup>In fact, this is a principle of engineering, and such principles would recommend measuring *twice* a year.

<sup>10</sup>These including CH<sub>4</sub> and the several other species like N<sub>2</sub>O, SF<sub>6</sub>, HFCs, and PFCs documented in the 2015 *Update of the Massachusetts Clean Energy and Climate Plan for 2020*.

<sup>11</sup>See Web references <https://www.eol.ucar.edu/homes/stephens/papers/2002JD003306.pdf>, <https://goo.gl/0zz7GP>, <http://www.esrl.noaa.gov/gmd/ccgg/aircraft/>, [https://www.jal.com/en/csr/iso/environment/atmospheric\\_observations.html](https://www.jal.com/en/csr/iso/environment/atmospheric_observations.html), <http://authors.library.caltech.edu/34900/1/amt-5-2003-2012.pdf>, and <http://www.esrl.noaa.gov/gmd/ccgg/aircraft/projects.html>.

<sup>12</sup>See CO<sub>2</sub>, CO and CH<sub>4</sub> measurements from the NOAA Earth System Research Laboratory's Tall Tower Greenhouse Gas Observing Network.

<sup>13</sup>California Environmental Protection Agency Air Resources Board

<sup>14</sup>See the NOAA ESRL GMD Lidar Network.

<sup>15</sup>See A. Khan, *et al*, "Low power greenhouse gas sensors for unmanned aerial vehicles", 2012.

<sup>16</sup>These might number as few as two or three dozen in the Commonwealth.

<sup>17</sup>See M. L. Fischer, S. Jeong *Inverse modeling to verify California's greenhouse gas emission inventory*, 2012.

<sup>18</sup>in **SJC-11961**, §2b, specifically, "Here, ... there is nothing in the statutory language to indicate that the department must regulate every source of emissions in the Commonwealth" and "... nothing in this opinion should be construed as requiring the department to regulate a particular number of sources or type of source."

the magnitudes of selected sources<sup>19</sup> must decline annually<sup>20</sup>, by declaring or embracing the annuality of enforcing such limits.

Clearly in the context of the GWSA itself<sup>21</sup>

The department shall **monitor** and regulate emissions of greenhouse gases with the goal of reducing those emissions

the job for the Department in 21N, §3(d) *logically includes* feedback to adjust regulations should a prior year's limit be missed.

To achieve such closed loop control, the Department requires corroboration of reductions using means independent of reported emissions. Without such a measurements protocol, it is not really possible to properly assess compliance or even compare year over year, but merely to *extrapolate*. That, in fact, is what the figure reporting progress in the Commonwealth charts does<sup>22</sup>. To arrive at a determination in that manner is indefensible. As modern business knows, evidence-based methods of management are always better.

The present reporting mechanism via the Massachusetts Greenhouse Gas Emissions Program, while based upon work of *The Climate Registry*, is not a *scientific* assessment of emissions, but an ANSI procedure for developing and updating a greenhouse gas emissions inventory for an organization. It is an *accounting mechanism*, not a **counting mechanism**. Worse, it excludes major categories of emissions<sup>23</sup>. While reporting and validation protocols demand participants be accredited, the data *do not meet current standards of scientific transparency* such as, for instance, those recommended by the *American Statistical Association*, nor are they subject to anything comparable to peer review. There are no procedures for scientifically independent, in-atmosphere checks on these reports.

Such monitoring of emissions is, in the long run, *cheaper* and *far less work* than burdening companies and agencies with tedious accounting of greenhouse gas inventories, and tracking

<sup>19</sup>SJC-11961, §2b, "Moreover, by the design of the act, the department is well equipped to say what actual reductions in emissions sources and source categories can be achieved because it has already inventoried emissions from every source and source category of emissions in the Commonwealth pursuant to G. L. c. 21N, §2", and presumably because G. L. c. 21N §4(e) creates a "de minimus threshold".

<sup>20</sup>SJC-11961, , "...[R]equires the department to promulgate regulations that establish volumetric limits on multiple greenhouse gas emissions sources, expressed in carbon dioxide equivalents, and that such limits must decline on an annual basis." I note that the SJC's use of "volumetric limits" might be a scientific blemish on its otherwise grand decision.

<sup>21</sup>G. L. c. 21N, §2(a), with emphasis added by the author.

<sup>22</sup>That is, the chart "MA GHG Emission Trends" as shown in 2014's *Massachusetts Annual GHG Emissions Inventory*, based upon 1990-2011 data, with partial 2012, or on the GHG emissions dashboard at the Web site, or in slide 6 of the *GWSA Stakeholder Overview slide deck*.

<sup>23</sup>If only the limits on large point source emissions are met, the 2020 and 2050 GWSA are hollow, for these do not represent even the majority of the Commonwealth's emissions. In 2013, according to the *Commonwealth of Massachusetts Global Warming Solutions Act 5-Year Progress Report's* Figures 6 and 8, reproduced below as Figure 1.1 and Figure 1.2, these point sources accounted for only about a third of the greenhouse gas limits.

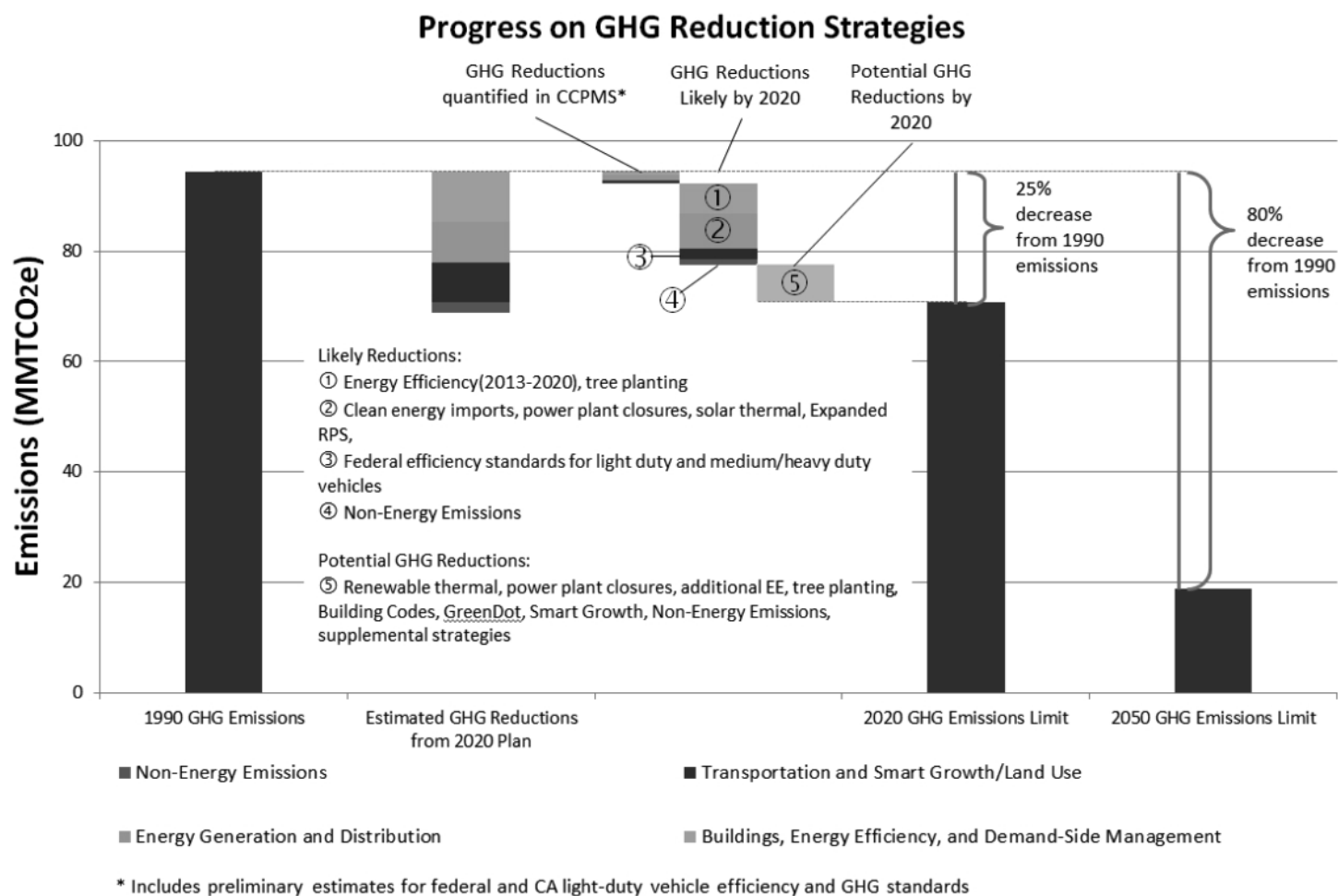
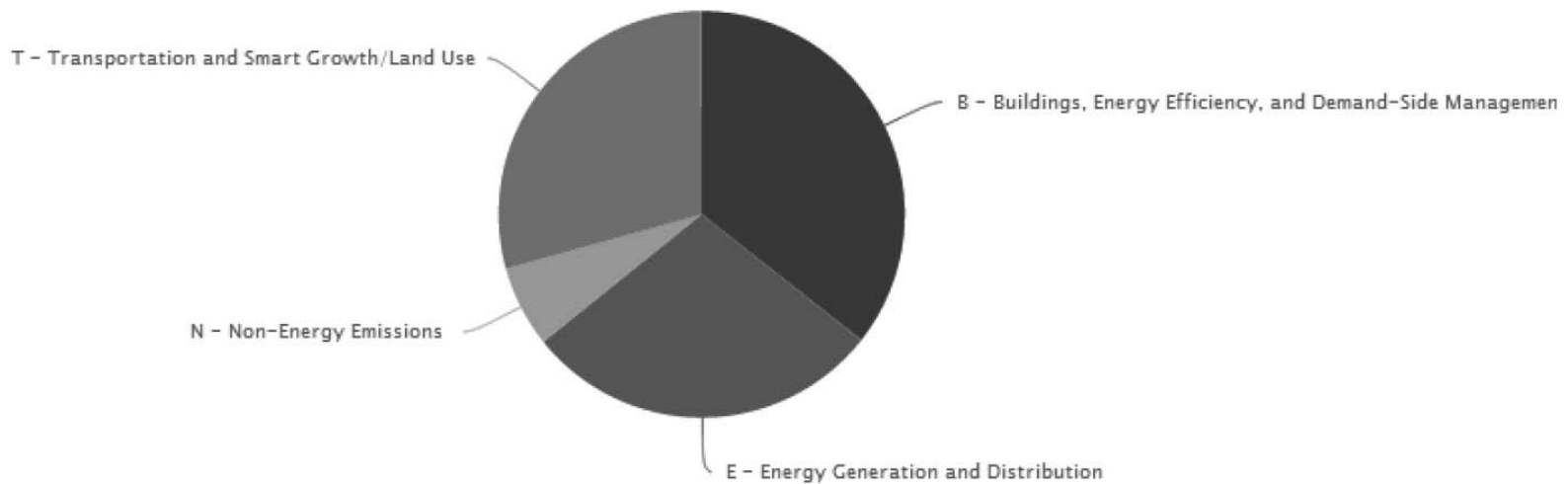


Figure 1.1: Figure 6: Progress on GHG Emission Reduction Strategies and the 2020 Limit from *Commonwealth of Massachusetts Global Warming Solutions Act 5-Year Progress Report*

## 2020 GHG Emission Reduction Targets

(Million Metric Tons (MMT) CO<sub>2</sub>e/percent reduction comped to 1990 levels)



Pie chart based on potential GHG emission reductions of 27.1% identified in the Clean Energy & Climate Plan for 2020 (Dec 2010)  
 1990 baseline = 94 MMT CO<sub>2</sub>e, 2020 Emission limit = 71 MMT CO<sub>2</sub>e

Figure 1.2: Figure 8: Screenshot of CCPMS Aggregate Progress Report (MA EEA 2013d) from *Commonwealth of Massachusetts Global Warming Solutions Act 5-Year Progress Report*

these against schedules. It's much smarter than subjecting a large number of people to the paperwork for such accounting. Why? Because while the cost per emitted tonne of CO<sub>2</sub> per unit of information collected about it is small when large point sources are managed this way, as magnitudes of emission from sources diminish and are spatially scattered, the costs increase markedly.

## 2.2 More people and funding

The commitment of the administration *and the Massachusetts legislature* to fulfilling the requirements of the GWSA as described by the SJC should and must include funding for *additional staff* at MA DEP, DOER, and DPU, as well as for a measurements campaign. Furthermore, systematic coordination required among the agencies under EER is needed to realize solutions. Failure to do so hides from the severity of the problem and the difficulty of its challenge. This is far harder, practically, scientifically, and politically, than other projects, such as regulating levels of emitted mercury, as difficult as that was<sup>24</sup>.

Funding for such staff could well be augmented by funds from fuel and other taxes, nudging residents towards more sustainable behavior, such as taxes upon natural gas or transport fuels. Residents' antipathy to taxes needs to be tempered with appreciation of the severity of our collective plight. Leadership shown by legislative and administration leaders can go a long way towards helping them to appreciate that. Moreover, in M.G.L. 21N, §4(4) in its consideration of "total potential costs and economic and noneconomic benefits," the GWSA balances near term costs, such as taxes, against long term benefits of greenhouse gas control, and of Massachusetts' contribution to climate disruption.

## 2.3 Use the markets

I urge the Department and its management to *use the markets* to help achieve the goals of the GWSA. Electrify sectors which are farther from GWSA limits, namely transport and heating. Then take advantage of the tremendous efficiencies and growth of solar photovoltaics ("PV"), especially when the capital comes from private sources. This is a *technology*, not merely an energy resource. Deloitte, a consultancy, estimated its growth rate in 2015 as having a U.S. CAGR<sup>25</sup> of 43%. Projections suggest<sup>26</sup> that in 2022, the *unsubsidized* per kWh cost of residential *solar PV plus storage* could well be less than the mere<sup>27</sup> *transmission cost* of grid electrical energy. DPU could help drive achieving the Department's requirements. In contrast, and based upon recent history, both DPU and the Massachusetts legislature appear to

<sup>24</sup>For a sketch of some of the political complexity when regulating mercury from power plants, see "EPA Ignored Science When Regulating Power Plant Mercury Emissions" at the Union of Concerned Scientists.

<sup>25</sup>Compounded Annual Growth Rate.

<sup>26</sup>Professor Tony Seba, Standard University, School of Business, 2016.

<sup>27</sup>And subsidized.

be working at cross purposes from the GWSA, for reasons which one can only speculate about. Such equivocation confuses the public, which *needs leading*.

Caps on incentivized participation impede free market competitive challenges and aggressive innovation. I know this is not really the Department's principal problem, but the degree to which it must get us to the 2050 GWSA limits is made all the much harder by engaging in equivocating talk about how we can continue to use fossil fuels and still decarbonize. No one has the early retirement of their new fossil fuel infrastructure on their depreciation schedules.

Thank you for your time.

DN: email=bayesianlogic.1@gmail.com  
Reason: I am the author of this document  
Location: Westwood, MA 02090  
Date: 2016.11.02 21:41:11 -04'00'



**Commonwealth of Massachusetts  
Department of Environmental Protection (MassDEP)  
Comments from Mass Energy Consumers Alliance  
Re: Reduction GHG Emissions under Section 3(d) of the GWSA**

November 16, 2016

Submitted via email to [climate.strategies@state.ma.us](mailto:climate.strategies@state.ma.us)

Energy Consumers Alliance of New England d/b/a Mass Energy is a nonprofit consumer and environmental advocacy organization with more than 20,000 members. Our mission since 1982 has been to make energy affordable and environmentally sustainable. We are dedicated to helping the Commonwealth reduce greenhouse gas (GHG) emissions as equitably and as economically as possible. We are especially devoted to ensuring the state meets the reductions mandated by the Global Warming Solutions Act (GWSA): 25% by 2020 and 80% by 2050.

It has been nearly a decade since Massachusetts first passed this nation-leading climate law. Although emissions have come down in that time, reductions are not occurring at a sufficient pace. Without more concerted effort and additional regulatory action, Massachusetts will fall short of the 2020 requirement. Failure to comply by 2020 will make it that much more difficult to achieve GWSA compliance in later years. As co-plaintiffs in *Kain v. MassDEP* we commend the Baker Administration for initiating full implement of the GWSA beginning by signing Executive Order 569. We appreciate that DEP has begun to explore strategies for complying with the Supreme Judicial Court's ruling and the GWSA. Especially since now, perhaps more than ever, Massachusetts must lead by example on climate action. The EO and this DEP process mark an important and necessary step in that direction.

Mass Energy offers the following comments related to information presented on November 2, 2016.

***Gas-Insulated Switchgear***

Mass Energy supports establishing a declining annual cap for SF<sub>6</sub> used in gas-insulated switchgear. The regulation should NOT incorporate an option for joint compliance based on the aggregate cap. As noted in the stakeholder presentation given on November 2, there are essentially only two entities that would be directly affected by the regulation: National Grid and Eversource. Allowing for joint compliance based on an aggregate of only two utilities would create a disincentive for either to comply. The cap and compliance should apply individually rather than jointly.

***Transportation***

Recognizing that the transportation sector is a significant contributor to air pollutants and comprises 40% of Massachusetts' GHG emissions, a declining limit on emissions must be set. The Clean Energy and

Climate Plan relies heavily on Vehicle GHG Standards to achieve the bulk of reductions in the sector. However, Mass Energy supports DOT's amendment to 310 C.M.R. 60.05. We urge the Department to set a limit of zero emissions from state passenger vehicles by 2020. And, to the extent that Massachusetts is able to accelerate conversion of its fleet of passenger vehicles to electric vehicles, it should. Electric vehicles have been shown to be integral to achieving significant emission reductions. In fact, according to a [March 2016 study by Synapse Energy Economics](#)<sup>1</sup>, increasing adoption of electric vehicles is good for the environment and saves consumers money. Even if the emission reductions achieved by doing so are relatively small, these efforts will allow the state to lead by example, having a far greater impact. Massachusetts has set an ambitious goal of 300,000 electric vehicles registered in the state by 2025. Converting the state's fleet of passenger vehicles is a step in the right direction. Mass Energy also strongly encourages the state to explore ways to accelerate the installation of charging infrastructure and the adoption of electric public buses. In the event that the state contracts with any ride-sharing service, there should be a requirement in place that the rides be provided by electric vehicles only.

### ***Methane Leaks from Gas Distribution System***

Leaks in the gas distribution system, particularly "superemitters" and leaks bearing other "significant environmental impact", must be identified, monitored consistently, and repaired. Doing so will benefit the environment, ensure public safety, and potentially save gas customers who are currently paying for lost and unaccounted for gas. Mass Energy supports setting an aggressive limit on emissions from this sector and encourages the Department to prioritize identification and repair of the largest leaks between now and 2020. Mass Energy also supports extending the declining limit for leaks beyond 2020 in order to achieve zero emissions from the distribution system as soon as possible. DEP should set a cap on emissions from lost and unaccounted for gas, as well as methane emissions from gas venting, fugitive emissions from compressor stations, metering and regulating stations, gas storage, and liquefied natural gas facilities.

This concludes comments related to materials presented on November 2. Separately, Mass Energy will submit comments related to the Electric Sector presentations provided on November 7. We look forward to ongoing engagement in this process.

**Please contact Clean Energy Program Director Eugenia Gibbons with questions about these comments, [Eugenia@massenergy.org](mailto:Eugenia@massenergy.org) or 617-524-3950.**

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<sup>1</sup> [http://www.synapse-energy.com/sites/default/files/RGGI\\_Opportunity\\_2.0.pdf](http://www.synapse-energy.com/sites/default/files/RGGI_Opportunity_2.0.pdf)





**Initial Comments from Mass Energy Consumers Alliance  
Re: Reduction GHG Emissions under Section 3(d) of the GWSA**

November 21, 2016

Submitted via email to [climate.strategies@state.ma.us](mailto:climate.strategies@state.ma.us)

Energy Consumers Alliance of New England d/b/a Mass Energy is a nonprofit consumer and environmental advocacy organization with more than 20,000 members. Our mission since 1982 has been to make energy affordable and environmentally sustainable. We are dedicated to helping the Commonwealth reduce greenhouse gas (GHG) emissions as equitably and as economically as possible. We are especially devoted to ensuring the state meets the reductions mandated by the Global Warming Solutions Act (GWSA): 25% by 2020 and 80% by 2050.

It has been nearly a decade since Massachusetts first passed this nation-leading law mandating significant climate action. Although emissions have come down in that time, reductions are not occurring at a pace that is sufficient to achieve meet the most immediate milestone. Without more concerted effort and additional regulatory action, Massachusetts will fall short of the 2020 requirement. Failure to comply by 2020 will make it that much more difficult to achieve GWSA compliance in later years. As co-plaintiffs in *Kain v. MassDEP* we commend the Baker Administration for initiating full implementation of the GWSA beginning with the signing of Executive Order 569. We also appreciate that DEP has begun to explore strategies for complying with the Supreme Judicial Court's ruling and the GWSA. Now, perhaps more than ever, Massachusetts must lead by example on climate action. The EO and this DEP process mark an important and necessary step in that direction.

We are grateful for the opportunity to offer feedback as DEP undertakes this endeavor and submit the following initial comments for your consideration.

**Emissions Cap on in-state electric generating units (EGU). (Proposed 310 C.M.R. 7.77)**

Before discussing the proposed clean energy standard, it should be noted that Mass Energy supports DEP's efforts to establish a cap on emissions from in-state emitting generating units (newly proposed 310 C.M.R. 7.77), but believes the cap should be set at a level stringent enough to ensure GWSA 3(d) compliance by 2020 – 70.8 MMtCO<sub>2</sub>e. Toward that end, the proposed aggregate cap must be lowered to more accurately reflect what is required of in-state EGUs if the Commonwealth is to comply with 3d. Additionally, given that the cap must be designed to accelerate emission reductions for existing and new generating facilities, there should be NO separate allowances for new facilities. And, to the extent that over-compliance credits are issued, they should not be bankable and must be used in the year in which they are created. Similar to the CES, the aim of this program should be to compel compliance rather than create incentives to prolong or extend the ability of a facility to emit GHGs.

**Clean Energy Standard (CES) applied to retail electricity sellers. (Proposed 310 C.M.R. 7.75)**

With regard to specific questions raised by DEP relative to proposed 310 C.M.R. 7.75, Mass Energy offers the following:

***When should the CES take effect, and should the CES remain in effect until 2050?***

The CES should be instituted immediately. 2018 should mark the first year of compliance and the standard should remain in place through 2050.

***What should the standard (expressed as a percent of electrical load) be for each year, or how should it be determined?***

The 2015 proposed regulation included a standard consistent with the goal of substantially reducing electric sector emissions by 80-95% by 2050, relative to the 1990 baseline. However, given delayed implementation, the urgency of climate mitigation, the GWSA mandate and compliance with the SJC's ruling, and recognizing that Massachusetts has an opportunity to be an exemplar in the region and the nation, Mass Energy proposes that a clean energy standard be set with the goal of reducing electric sector emissions in each subsequent year such that by no later than 2050 electricity is completely supplied by clean energy.

***Should municipal light plants be required to comply?***

Yes, the CES requirement should extend to municipal light plants. MLPs comprise 15% of the state's electricity load. Massachusetts cannot *equitably* achieve the required emission reductions without their inclusion in the CES. Therefore, MLPs like all other suppliers should also comply with the policies, programs, and standards designed to get us there.

***Should eligibility for clean generators be based on a list of "clean" technologies, or on an emissions threshold (e.g., a percent cleaner than new combined cycle natural gas generation)? How should the list of technologies or the emissions threshold be determined?***

CES-eligible facilities must be zero-emitting in order to effectively reduce emissions at a level capable of achieving GWSA compliance. Put another way, the only acceptable emissions threshold for eligible resources is ZERO. However, in instances when non-emitting resources are being considered, we strongly encourage DEP to also account for life-cycle emissions when considering what does or does not qualify (i.e., new large-scale hydro facilities).

***Should eligibility for clean generators be limited to "new" facilities? E.g., should existing hydroelectric generation be allowed for compliance? If so, what should be the cutoff for being considered new? What about transmission capacity for electricity imported into New England?***

Eligibility for the proposed CECs associated with a CES should be limited to "new" facilities that meet the zero emission threshold mentioned above, but excluding large-scale hydro in part because of the issue of life-cycle emissions. With regard to existing facilities, in order to avoid what has been referred to as windfall profits,<sup>1</sup> CES eligibility should not be extended to existing large hydroelectricity units or nuclear generation, despite their low-emission profile.

Mass Energy encourages DEP to maintain an open mind towards ways to optimize least cost GHG reduction measures like energy efficiency as a means of complying with the CES. We also encourage DEP

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<sup>1</sup> See discussion of windfall payment, Stanton et al., [A Clean Energy Standard for Massachusetts](#) (October 25, 2013).

to consider ways to account for the potential of emerging technologies, like storage, as a CES-eligible resource. We recognize this approach will require establishing a way to assign credit to and value EE (consider regional EM&V standards or a GIS-like tracking system), but it is not insurmountable.

A Clean Energy Standard is a flexible enough mechanism to allow for energy efficiency and in the first year or two of compliance, this additional EE may help to assuage concerns about additionality v. accounting maneuvers that were expressed at the November 7<sup>th</sup> meeting. This was specifically in regards to the 6% of existing, unclaimed renewable resources that DEP identified as being potentially available to comply with the CES by 2020. Finally, accounting for EE represents the type of bold and innovative action that Massachusetts must take in order to lead by example in the region and across the country.

***Should the CES include flexibility options such as an alternative compliance payment?***

No, alternative compliance payments should NOT be allowed under the CES. The purpose of the CES is to incent annual GHG emission reductions capable of attaining GWSA compliance. ACPs would create a means for electricity suppliers to pay their way to compliance without taking real action to reduce emissions, rendering the CES ineffectual.

In closing, Mass Energy is encouraged by DEP's consideration of a cap on EGUs and a Clean Energy Standard (CES). We support establishing a stringent cap and view it as integral to ensuring GWSA 3d compliance, but also recognize the cap as key component in transitioning to clean energy generation within the Commonwealth. In the same way, Mass Energy supports a CES that complements Massachusetts' Renewable Portfolio Standard (RPS) and promotes incremental clean energy precisely because it will facilitate compliance with the GWSA while driving transformation of our electric grid. Mass Energy encourages DEP to establish a standard capable of accomplishing this so long as it does NOT create incentives for mature resources like large-scale hydroelectricity or nuclear generation, despite their low-emission profile. Additionally, Mass Energy strongly supports a CES that places emphasis on maximizing the benefits of energy efficiency alongside renewable generation technology and urges DEP to explore ways to integrate energy efficiency above what is required in the Three Year Energy Efficiency Investment Plans (3YP) and emerging technologies, such as storage.

This concludes comments related to materials presented on November 7. We look forward to ongoing engagement in this process.

**Please contact Clean Energy Program Director Eugenia Gibbons with questions about these comments, [Eugenia@massenergy.org](mailto:Eugenia@massenergy.org) or 617-524-3950.**

**From:** [Anne](#) Goodwin

**Sent:** Wednesday, November 16, 2016 4:40:33 AM (UTC-05:00) Eastern Time (US & Canada)

**To:** Strategies, Climate (DEP)

**Subject:** Concern about Gas Leaks in Arlington

I am writing to express my concern about the number of gas leaks that have gone unattended by the utility companies in Massachusetts.

I recently helped Mother Out Front tag the 177 gas leaks in the town of Arlington, to raise awareness of the dangers. There are streets in Arlington where one can actually smell the leaking gas.

The methane from the Natural Gas leaks is bad for our health, bad for the plant life around us, adds to the warming of the planet and could pose a safety hazard. Also, we, the consumers, are the ones paying for lost and unaccounted for gas.

For all these reasons, we need strict regulations to ensure that the gas companies fix all gas leaks. Identifying and fixing the largest leaks (the "super-emitters") should happen as soon as possible, but we also want all other gas leaks fixed in a timely manner.

Thank you for your attention.

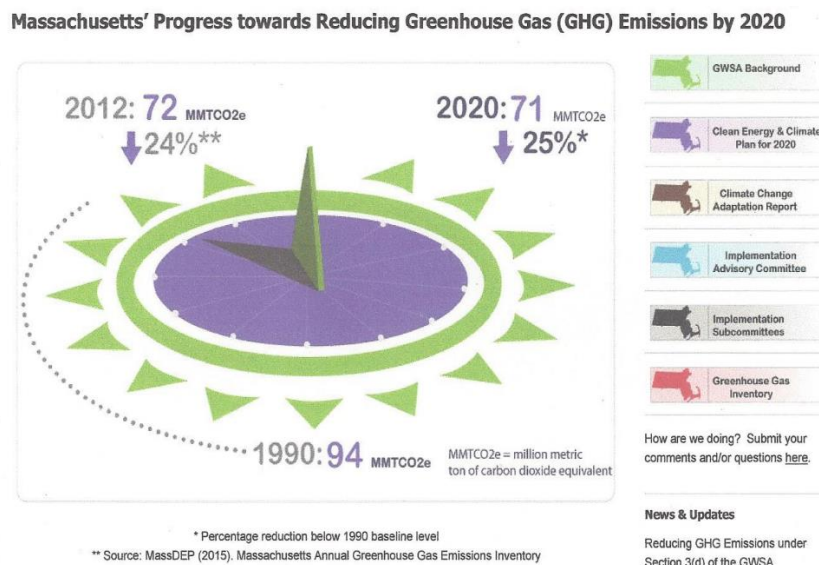
Anne Goodwin

# Comments on Department of Environmental Protection plans for achieving mandated reductions in greenhouse gas emissions by 2012 and beyond

F William Green, Cambridge; ynotbgreen@comcast.net

An undated Executive Office of Energy and Environmental Affairs (EEA) web page titled ***“Massachusetts’ Progress towards Reducing Greenhouse Gas (GHG) Emissions by 2020”*** at first appears to indicate that the state is on a remarkable and timely course toward achieving its GHG reductions goal. This information suggests that it may not be that difficult to accomplish the last bit of greenhouse gas reduction to meet the 2020 mandated goal of 25% and we have four more years to do it. The sun-dial graphic [figure 1] indicates that in achieving a reduction to 72mmtCO<sub>2</sub>e in 2012 the Commonwealth has already decreased its GHG by 24% from the 1990 baseline figure of 94 mmtCO<sub>2</sub>e and thus might only have a percent or two more to reach the mandated target. There are several important reasons to doubt the likelihood of achieving this 2020 mark with any sort of ease or lack of vigor.

Figure 1

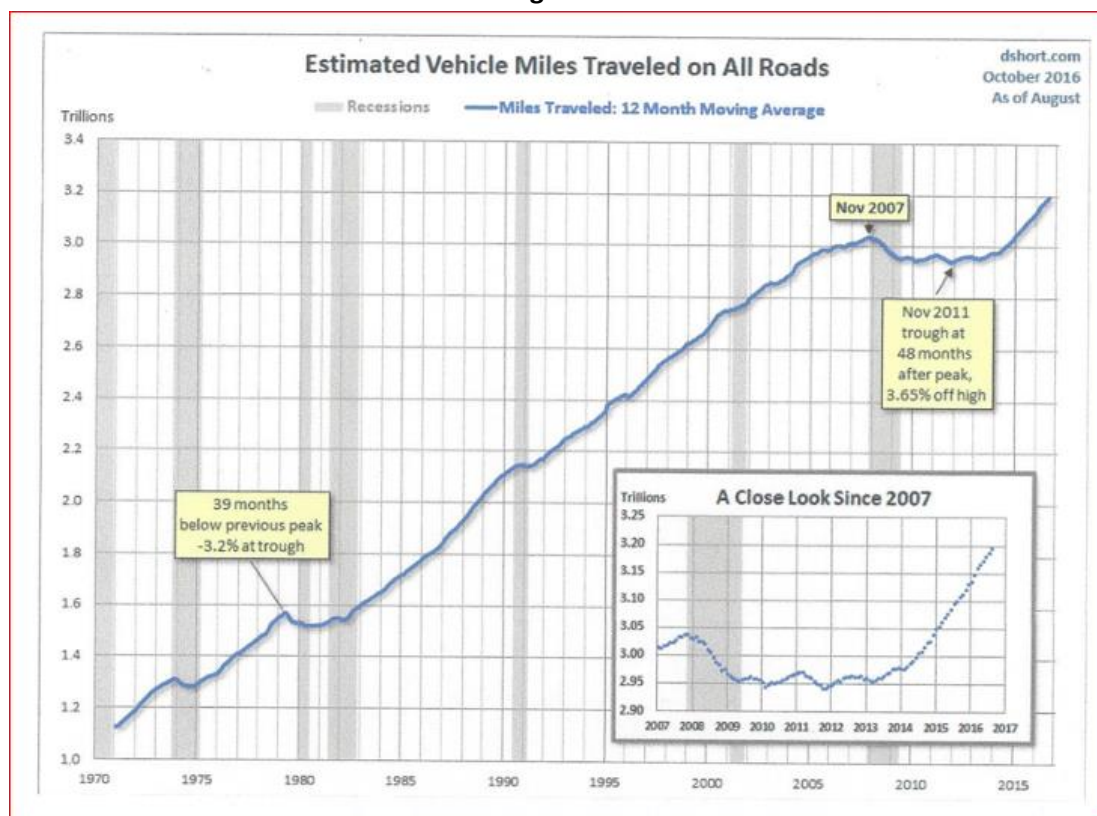


First of all, the GHG reported for 2013 has gone up to 75.8mmtCO<sub>2</sub>e, a five percent increase; and we have no published data for 2014 and 2015 to help in determining the currently developing trajectory. Somewhat more to the point, probably, is the likelihood that certain one-time low-hanging fruit have been harvested and that such remarkable progress as seen in those years between 2008 and 2012 cannot continue, and indeed, may well have already ceased. One must be careful not to underestimate additional likely explanations for much of the Commonwealth’s impressive reductions from 2008 to the last reporting date of 2013.

From 2008 to 2012, there were coincidental factors that clearly have bent the curve in such a fortuitous direction suggesting, falsely, that we are definitely on track to meet the 2020 goal. Several of these coincidences are “one-offs” and may not be replicable and may not endure:

- The Great Recession:* Beginning in late 2007 the economic condition of the country seriously deteriorated. U.S. gross domestic product contracted by 5%. Unemployment doubled. Household assets decreased by at least one third. The recession had the effect of reducing energy use throughout the economy including in the transportation sector (approximately 40% of the state's GHG) with the result of considerably lower than projected greenhouse gas emissions. For example, in 2008 the previously steadily rising curve in miles/year travelled by car dropped by an estimated 70 to 80 billion miles or 3.7% and flattened out through 2012 (precisely the time frame corresponding to the EEA's report of GHG reductions credited in the "Massachusetts' Progress towards Reducing Greenhouse (GHG) Emissions by 2020"). [figure 2] Not only were 70 to 80 billion travel-miles avoided in that first year of the great recession, subsequent years of decreased vehicle miles travelled resulted in several hundred billion additional vehicle miles avoided and their resultant GHGs.

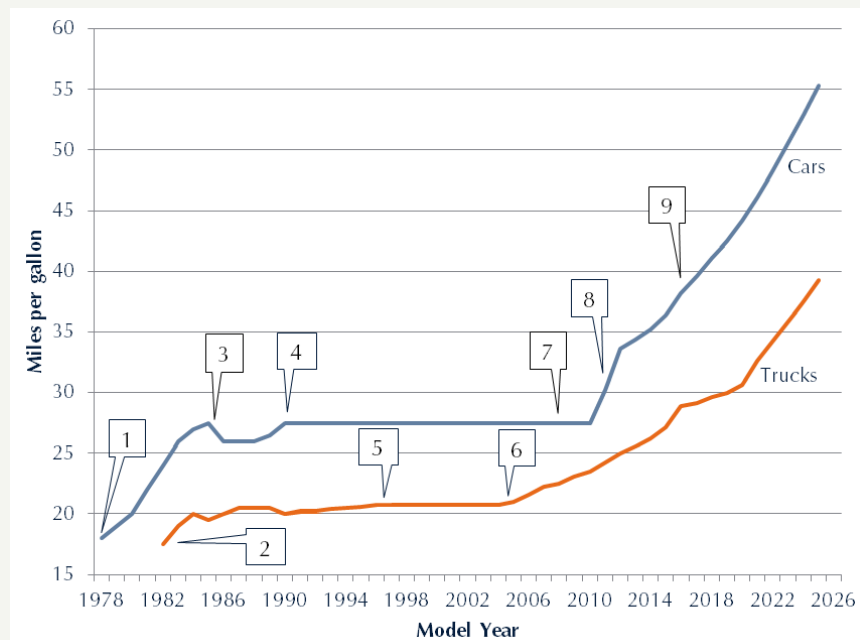
Figure 2



- Increase in fuel economy standards:* In 2009 with the US automobile industry on its heels, President Obama worked out a deal with the near-bankrupt car companies that would raise the light vehicle standard to 54.5 mpg by 2025. [figure 3] With this expectation the NHTSA, EPA and the auto industry began accelerating the move toward higher levels of fuel efficiency, and in fact, achieved levels beyond those expected. The prospect of rather sudden, dramatic changes in California and national CAFE standards significantly moved the needle on fuel efficiency and on the reduction of GHG emissions in Massachusetts and throughout the country.

**Figure 3: Fuel economy standard for passenger vehicles from MY1978-2025.**

Since 1975, a number of changes have been made to the standards. Figure 3 provides an annotated history of the U.S. CAFE standards. A number of other countries have also instituted fuel economy standards, with most establishing more aggressive targets than the United States. See [here](#) for more details.



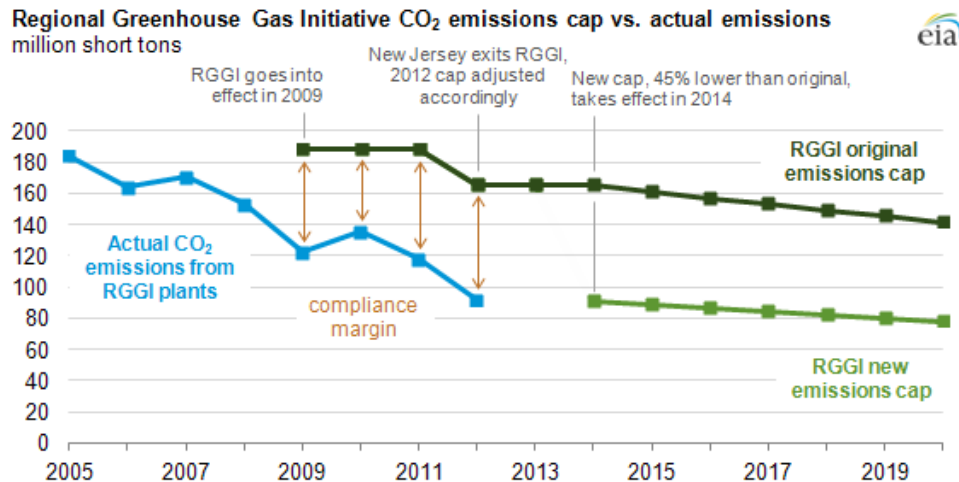
Source: *NHTSA Summary of Fuel Economy Performance, NHTSA MY2017-2025 Factsheet*

- |   |   |
|---|---|
| 1. 1978-1985: Congress sets car standard (1978-1985)        | 6. Bush Admin issues new truck targets (2005-2007)          |
| 2. DOT sets truck standard to max feasible (1979-1996)      | 7. EISA changes CAFE to footprint standard (2008-present)   |
| 3. DOT decreased car standard (1986-1989)                   | 8. Obama Admin issues new car & truck standards (2012-2016) |
| 4. DOT sets car standard to 27.5 mpg (1990-2010)            | 9. Obama Admin issues new car & truck standards (2017-2025) |
| 5. Congress freezes truck standards at 20.7 mpg (1997-2001) |   |

- The progressive traction of the Regional Greenhouse Gas Initiative (RGGI):** With the prospect of RGGI coming on the scene there was a noteworthy decrease in GHG beginning in the 2007 to 2008 period. [figure 4] While there is every expectation for RGGI to progressively ratchet down GHG emissions in its member states, there appeared to be a rather marked reduction related to contraction of the cap in 2008. The prospect for RGGI caps coming into effect in 2009 may have stimulated an anticipatory one-time drop in GHG or the dip may have been related to the great recession, as noted above.



Figure 4



Recognized as first in the nation by the American Council for Energy Efficiency Economy, now, three years straight the Commonwealth appears to be out in front again on issues relating to climate change and the necessity of markedly reducing greenhouse gas. The Department of Environmental Protection and the Executive Office of Energy and Environmental Affairs and legislature deserve due credit for that. My sense, however, is that a considerable proportion of the reduction in GHG may well be explained by external factors such as the great recession, the emerging rigor in light vehicle fuel economy standards and the increased traction of RGGI, not just by executive and legislative prescriptions. Plans for achieving full compliance with the Global Warming Solutions Act by 2020 will likely need adjusting to compensate for the fortuitous near 24% decrement in GHG reported in the 2012 figure of 72 mmTCO<sub>2</sub>e. The DEP and EEA must prepare for the eventuality of a significant shortfall in their predicted reduction in GHG mmTCO<sub>2</sub>e as numbers come out for 2013 and later years. Beyond that, once the low-hanging fruit have all been picked, the rigor of moving to the GWSA 80% reduction in GHG will become exceptionally daunting and must be anticipated. How will we get there from here?

#### Recommendations for DEP and EEA:

1. Adopt the mindset that climate change is a huge and urgent threat and that the DEP and EEA are IN CHARGE in leading the effort to limit its impact
2. Make protecting the environment the supreme issue, not the bureaucracy or the integrity of a law
3. Aggressively work to find an extra 5%-10% reduction in GHG in evolving plans for meeting 2020 goal (this as a cushion if GHG reduction numbers are falling short of predictions)
4. Increase budget and young hires for the Department of Environmental Protection and EEA
5. Check that the profile of state vehicles is appropriately fuel efficient ("leading by example")
6. Consider modifying temperature settings in state buildings, to save energy (lead by example)
7. Reinstate 55 mph speed limits to increase fuel efficiency (as was done in 1970s)
8. Enforce there being no new fossil fuel pipelines, gas plants, or compressor stations in Massachusetts. If the goal is to decrease GHG and if the burning of fossil fuels is the main driver of anthropogenic climate change, we must not encourage importing and using more such fuels by building more pipelines.
9. Set 2018 as the date by which the GHG reduction figure will be proposed for 2030
10. Be on time with GHG reduction reports; the 2013 report is not out, nor is the one for 2014
11. Declare/encourage carbon pricing as a rational, efficient route to faster reduction in GHGs



**From:** Susan Helms Daley

**Sent:** Monday, November 14, 2016 8:48:14 AM (UTC-05:00) Eastern Time (US & Canada)

**To:** Strategies, Climate (DEP)

**Subject:** Thoughts on Climate Plan Hearing

Hello,

The Executive Order is an important and welcome first step towards meeting the GWSA. The Governor has reaffirmed that climate change is a serious threat and that the Administration intends to meet the requirements of the GWSA. We are grateful for these important steps.

That said, the Executive Order is not enough. Right now, we are **not** on track to hit the 2020 emissions reductions mandated by the GWSA. The Global Warming Solutions Act targets are not aspirational. They are legally required. The Supreme Judicial Court has ruled that the state has an obligation to put regulations in place that ensure we close the gap and achieve compliance by 2020.

We need specific plans and accurate accounting to ensure that the regulations created by the DEP get us to 25% below 1990 levels by 2020.

The current Clean Energy and Climate Plan (CECP) includes many key policies/programs intended to achieve compliance, but we are lagging in meeting 2020 targets and in implementing many of the measures contained in the plan.

Similarly, the new clean energy procurements included in the omnibus bill (hydro and offshore wind) are critical to helping MA transition to clean energy over the coming decades. But because those resources will not come online until after 2020, they will not help us meet the GWSA requirements.

We demand that you rapidly reduce greenhouse gas emissions in the interest of protecting our children's and everyone's future. Natural gas leaks and new gas infrastructure should be a focus of these reductions. The Department of Environmental Protection should issue regulations that extend beyond 2020 on methane emissions to ensure continued reduction. DEP should also partner with independent researchers to help define "leaks of significant environmental impact." The administration should also factor GWSA impacts into decisions related to new generation facilities and pipelines. Continuing to pursue new gas infrastructure is incompatible with our need to comply with the GWSA.

Thank you for continuing to take this matter seriously. Time is running out!

Best,  
Susan Helms Daley

November 21, 2016

Jordan Garfinkle  
Environmental Analyst  
Massachusetts Department of Environmental Protection  
1 Winter Street  
Boston, Massachusetts 02108

**Re: 310 CMR 7.77, Reducing Greenhouse Gas Emissions from Electricity Generating Facilities Program**

Dear Mr. Garfinkle:

Thank you for the opportunity to comment on the draft of 310 CMR 7.77, Reducing Greenhouse Gas Emissions from Electricity Generating Facilities Program. We support the Department's decision to have the new regulation apply to electric generating facility regulated under EPA's 40 CFR 98.40.

Covanta is a national leader in developing, owning and operating facilities that convert post recycled municipal solid waste ("MSW") into renewable energy including four energy-from-waste (EfW) facilities in Massachusetts.

Energy-from-waste facilities are internationally recognized as a source of greenhouse gas mitigation, including by the U.S. EPA,<sup>i</sup> U.S. EPA scientists,<sup>ii</sup> the Intergovernmental Panel on Climate Change ("IPCC"),<sup>iii</sup> the World Economic Forum,<sup>iv</sup> the European Union,<sup>v,vi</sup> the California Department of Resources Recycling and Recovery,<sup>vii</sup> the Center for American Progress,<sup>viii</sup> the Clean Development Mechanism (CDM) of the Kyoto Protocol, and the Voluntary Carbon Standard.

EfW contributes to the reduction of GHGs in three ways:

- First, it provides electricity that otherwise would likely be generated by natural gas facilities;
- Second, it results in the permanent disposal of solid waste that would have been destined for a landfill, where it would contribute to the emission of methane for years; and
- Third, it results in the recovery of metals for recycling.

A major contributor to GHG emissions is the uncaptured emissions of methane from landfills, a GHG that is estimated to be 28 - 34 times more potent than CO<sub>2</sub> on a 100 year basis, and 84 times more potent over 20 years. Landfills are the third largest source of methane emissions. EfW technology avoids methane emissions entirely. Nationally, diverting municipal solid waste (MSW) from landfills to EfW actually saves a ton of GHG emissions as CO<sub>2</sub> equivalents. (CO<sub>2</sub>e) Even when factoring in a cleaner electrical grid and better landfill performance, EfW facilities in Massachusetts still reduce net GHG emissions on a lifecycle basis by approximately 0.7 ton of CO<sub>2</sub> for every ton of MSW diverted from

landfills.,. By reducing emissions that would have otherwise occurred, EfW is the only major source of electricity that actually reduces GHG emissions.

Energy-from-waste can play a vital role in helping the Commonwealth meet its climate change goals. We look forward to continuing to work together. I would be pleased to meet with you, if you have any questions, or would like to discuss our comments further.

Best regards,



Scott Henderson  
Senior Director, Government Relations  
Covanta Energy

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<sup>i</sup> See U.S. EPA (2016) Energy Recovery from the Combustion of Municipal Solid Waste (MSW) Webpage, <https://www.epa.gov/smm/energy-recovery-combustion-municipal-solid-waste-msw>

<sup>ii</sup> Kaplan, P.O, J. DeCarolis, and S. Thorneloe, 2009, Is it better to burn or bury waste for clean electricity generation? *Environ. Sci. Technology* 43 (6) pp1711-1717. Available at: <http://pubs.acs.org/doi/abs/10.1021/es802395e>

<sup>iii</sup> EfW identified as a “key mitigation measure” in IPCC, “Climate Change 2007: Synthesis Report. Contribution of Work Groups I, II, and III to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change” [Core Writing Team, Pachauri, R.K and Reisinger, A. (eds.)]. IPCC, Geneva, Switzerland, 104 pp. Available at: [http://www.ipcc.ch/publications\\_and\\_data/publications\\_ipcc\\_fourth\\_assessment\\_report\\_synthesis\\_report.htm](http://www.ipcc.ch/publications_and_data/publications_ipcc_fourth_assessment_report_synthesis_report.htm)

<sup>iv</sup> EfW identified as a key technology for a future low carbon energy system in World Economic Forum. *Green Investing: Towards a Clean Energy Infrastructure*. January 2009. Available at: [http://www3.weforum.org/docs/WEF\\_IV\\_GreenInvesting\\_Report\\_2009.pdf](http://www3.weforum.org/docs/WEF_IV_GreenInvesting_Report_2009.pdf)

<sup>v</sup> EU policies promoting EfW as part of an integrated waste management strategy have been an overwhelming success, reducing GHG emissions over 72 million metric tonnes per year, see European Environment Agency, *Greenhouse gas emission trends and projections in Europe 2009: Tracking progress towards Kyoto targets* [http://www.eea.europa.eu/publications/eea\\_report\\_2009\\_9](http://www.eea.europa.eu/publications/eea_report_2009_9)

<sup>vi</sup> European Environmental Agency (2008) Better management of municipal waste will reduce greenhouse gas emissions. Available at: [http://www.eea.europa.eu/publications/briefing\\_2008\\_1](http://www.eea.europa.eu/publications/briefing_2008_1)

<sup>vii</sup> CalRecycle. 2012. CalRecycle Review of Waste-to-Energy and Avoided Landfill Methane Emissions. Available at: <http://www.calrecycle.ca.gov/Actions/PublicNoticeDetail.aspx?id=735&aiid=689>

<sup>viii</sup> Center for American Progress (2013) Energy from Waste Can Help Curb Greenhouse Gas Emissions <https://cdn.americanprogress.org/wp-content/uploads/2013/04/EnergyFromWaste-PDF1.pdf>

**From:** [Sandy](#) Huckleberry

**Sent:** Wednesday, November 16, 2016 2:26:19 PM (UTC-05:00) Eastern Time (US & Canada)

**To:** Strategies, Climate (DEP)

**Subject:** Public comment

Hello, my name is Sandra Huckleberry. I am a worker, a homeowner and a mom who has lived in Massachusetts for c. 30 years. Please consider, during your deliberations:

1) global warming is here and getting worse and the only way to lessen the catastrophe is to keep all remaining fossil fuels in the ground

2) the coming administration is unreliable therefore it is the states responsibility to rescue us from the coming catastrophe

3) the Massachusetts DEP is our rescue force and every action you take RIGHT NOW will be scrutinized for years to come. Listen to the direst warnings. Do not think of yourselves as inconsequential bureaucrats who must bend. Take control and craft the toughest possible regulations. How about no fossil fuels allowed Massachusetts by 2030? Honestly we can do it, and if we do it, the world will follow.

Thank you.

Sandy Huckleberry

**From:** CLAIRE

**Sent:** Tuesday, November 15, 2016 7:33:31 PM (UTC-05:00) Eastern Time (US & Canada)

**To:** Strategies, Climate (DEP)

**Subject:** Comments on gas leaks

To DEP:

As will be said more fully by others, DEP needs to use the empirical evidence and methodology of the most recent science available, not seriously outdated, overly geographically general and materially unspecific standards in calculating methane emissions from gas infrastructure if you hope to produce anything meaningful, rather than just an exercise in paper-pushing. Nature can tell the difference. So can we. Our children are depending on it.

The following paraphrases the testimony I gave verbally at the DEP hearing on gas leaks on 11/2/16:

I'm Claire Humphrey from Jamaica Plain. I am the mother of two, a 15 year old daughter and a 13 year old son. I'm here representing Mothers Out Front. Mothers Out Front is a group of mothers and grandmothers, along with others, working to build political will to stop climate change which threatens our children. Mothers Out Front works with a number of allies, many of whom are here today and who you'll be testifying. Would everyone who's here from Mothers Out Front please stand up? (At least 20 people stood up.) We all have faces in mind, just like you, that bring us here.

When my daughter was really little, I used to brush her hair, get her dressed, things like that. But when she got a little older, she started taking over doing these things herself. About a month after she started brushing her own hair, she asked me to braid it. I said "Sure, honey.", turned her around and tucked her between my knees. That's when I realized that for a month, she'd been brushing over the surface of her hair and she had an enormous hairball tangle on the back of her neck. She'd been brushing over the surface while a big problem was building up underneath.

That's pretty much what we've been doing about gas leaks, which are literally under the surface of our streets. We have to stop brushing over the surface, while ignoring the problem that's building up underneath. Gas leaks are not in the Massachusetts Greenhouse Gas Inventory. They're not well-tracked by the utilities. But we must deal with what's actually there, not what's on the surface.

In my daughter's case, that was several hours, about a cup of olive oil, and a crochet hook. And, in future, independent monitoring by me and better training for her.

To fix gas leaks, we need definitions and plans from DEP that are effective and accurate and deal with what's actually there. DEP needs to go beyond what might be in the Inventory or utility data, to what's actually there, so we can meet our targets and actually bring emissions down.

That is your mission. My children, your children, our children, will have to live with the actual consequences of what you do now.

I am missing the second to last game of an undefeated season for one of my children to be here, and I called in two carpool favors. These are coveted and tracked very accurately. This is probably true for a number of us here today.

But, we are trusting you with our children. That's what bring all these mothers here. And there are many other mothers who are watching.

Thank you.

Claire E. Humphrey  
Mothers Out Front

November 21, 2016

**By Electronic Mail ([climate.strategies@state.ma.us](mailto:climate.strategies@state.ma.us))**

Commissioner Martin Suuberg  
Department of Environmental Protection  
1 Winter Street  
Boston, MA 02108

**Subj: Initial Comments re: GWSA Section 3(d) Regulations - Electric Power Sector**

Dear Commissioner Suuberg,

Conservation Law Foundation (“CLF”) applauds the Department of Environmental Protection’s (“DEP’s”) inclusion of enforceable declining annual emissions caps on large in-state electric generating facilities, as well as a Clean Energy Standard, as part of the Section 3(d) rulemaking required by the court’s decision in *Kain v. Department of Environmental Protection*, 49 N.E. 3d 1124 (Mass. 2016). If properly structured, both have the potential to play an important role in ensuring that the Commonwealth meets its GWSA emissions obligations in 2020 and 2050.

In continuing to develop DEP’s proposed *Kain*-compliance rulemaking, please consider and incorporate the following comments (together with those submitted by CLF on November 16, 2016) regarding the rulemaking overall and DEP’s proposed regulations for the electric power sector in particular:

**Rulemaking Must Demonstrate Compliance with Kain**

Although DEP has GWSA authority to regulate emissions beyond 2020—something we strongly encourage it to do—this rulemaking must at a minimum “ensure that [GWSA’s] legally mandated reductions are realized by the 2020 deadline” in accordance with *Kain*.<sup>1</sup> As a result, the rulemaking must include legally enforceable, declining annual volumetric emissions caps that are sufficient to ensure that the Commonwealth’s emissions are less than or equal to the equivalent of 70.8 million metric

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<sup>1</sup> *Kain v. Department of Environmental Protection*, 49 N.E. 3d 1124, 1142 (Mass. 2016) (“The purpose of G.L. c. 21N is to attain actual, measurable, and permanent emissions reductions in the Commonwealth, and the Legislature included § 3 (d) in the statute to ensure that legally mandated reductions are realized by the 2020 deadline.”).

tons of carbon dioxide (“MMtCO<sub>2</sub>e”) in 2020.<sup>2</sup> While DEP has some discretion in articulating its methodology for achieving that goal, its discretion is not unbounded and must be supported by publicly-available, substantial evidence.

To that end, DEP’s rulemaking must include a detailed explanation, with supporting quantitative analysis, of how the proposed new (and revised) regulations will be enforced, and how they will collectively work over their first three years to guarantee 2020 emissions of 70.8 MMtCO<sub>2</sub>e or less in light of the Commonwealth’s most recent comprehensive assessment<sup>3</sup> of the ability of existing programs and policies to deliver that volumetric mandate. Importantly, DEP’s supporting analysis must fully account for—and its regulations must resolve—the “significant risk” identified by the Secretary of Energy and Environmental Affairs that, even if the state’s existing regulatory structure is fully implemented, the Commonwealth’s 2020 emissions may be as high as 76 MMtCO<sub>2</sub>e, or about 5% above the 2020 volumetric cap.<sup>4</sup>

Finally, DEP must ensure that each regulation it will rely on to ensure that the Commonwealth’s emissions are less than or equal to 70.8 MMtCO<sub>2</sub>e in 2020 is immediately and meaningfully enforceable and, to protect the 2020 viability of the rulemaking effort, DEP should require that every agency, department, board, commission, and instrumentality of the Commonwealth must not issue any permit, license, or other administrative approval or decision, or make any grant of funds for any activity, that would interfere with, threaten, or prevent the Commonwealth’s achievement of that mandate.

### **Proposed EGU Emissions Cap (new 310 C.M.R. 7.77)**

DEP’s proposed emissions cap on in-state electric generating facilities is the cornerstone of the Department’s proposed Section 3(d) rulemaking and will likely control whether or not the rulemaking fulfills the legal obligation described by the court in *Kain*. CLF believes that the following modifications to DEP’s proposed regulation are necessary to ensure that it does:

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<sup>2</sup> As the state has previously determined, that volume of emissions is equivalent to a 25% reduction in state-wide emissions compared to the Commonwealth’s 1990 emissions level, the legally enforceable emissions limit the GWSA specifies for the calendar year 2020.

<sup>3</sup> *Massachusetts Clean Energy and Climate Plan for 2020* (Dec. 31, 2015) (the “2015 CECP”).

<sup>4</sup> *Id.* at 11 (“[T]here is a significant risk that the total amount of reductions realized in 2020 will be less than 25%, compared to the 1990 emissions.”); *accord id.* at 13 (Table 3). As the 2015 CECP makes clear, the potential variability in predicting the state’s 2020 emissions is due to a number a factors beyond the lack of required Section 3(d) annual emissions caps including, but not limited to uncertainty regarding: the weather, implementation of federal vehicle standards and their effect in Massachusetts, and the availability and timing of potential future low-emissions electricity imports. *See id.* at 13-15.



- (1) **2020 Aggregate Cap of No More than 6.75 MMtCO<sub>2</sub>e** – Given the relatively small amount of new incremental emissions reductions anticipated from the other *Kain*-compliant regulations in DEP’s Section 3(d) rulemaking,<sup>5</sup> the aggregate cap on in-state electric generating facilities must be sized to ensure that the Commonwealth’s 2020 emissions cap is met. Using the Commonwealth’s best estimate of likely emissions in 2020 assuming all existing programs and policies are fully enforced, the state’s entire electric power sector—which includes imported electricity emissions as well as emissions that would be capped by new 310 C.M.R. 7.77—must emit no more than 8.8 MMtCO<sub>2</sub>e in 2020 in order to ensure 2020 statewide emissions of 70.8 MMtCO<sub>2</sub>e or less.<sup>6</sup> As emissions from in-state electric generating facilities historically account for at least 75% of the total electric power sector emissions in the state’s Greenhouse Gas (“GHG”) Inventory,<sup>7</sup> in order to ensure sector-wide emissions of no more than 8.8 MMtCO<sub>2</sub>e, the proposed aggregate 2020 cap for in-state electric generating facilities must be no more than about 6.75 MMtCO<sub>2</sub>e, almost 2 MMtCO<sub>2</sub>e *lower* than DEP’s current proposal.<sup>8</sup>
- (2) **No Separate Emissions Allowance for New Facilities** – Increasing the state’s GHG Inventory emissions allowance by 1 MMtCO<sub>2</sub>e in order to accommodate new power plants during a period in which DEP must otherwise *reduce* the emissions of in-state electric generating facilities by almost 6 MMtCO<sub>2</sub>e<sup>9</sup> is squarely inconsistent with the GWSA. This is particularly so given that, in order to comply with *Kain*, the aggregate in-state facility cap must be almost 2

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<sup>5</sup> No more than 1 MMtCO<sub>2</sub>e, and potentially as little as 160,000 MMtCO<sub>2</sub>e, according to DEP. See DEP Stakeholder Discussion Slides (Oct. 28, 2016), Deck 1 (GWSA - Overview), at 8-9 (indicating between 0.1% and 1% reduction from new transportation regulations, about 0.05% reduction from new gas leaks regulations, and about 0.01% reduction from modifications to the SF<sub>6</sub> regulations).

<sup>6</sup> According to the 2015 CECP, due to factors beyond the state’s current regulatory control (see note 4 above), 2020 statewide emissions from the uncapped building, transportation, and “other” sectors may be as high as 62 MMtCO<sub>2</sub>e. 2015 CECP at 13-15.

<sup>7</sup> In 2013, the last year for which the state has published complete GHG emissions data, in-state electric generating facilities emitted 12.52 MMtCO<sub>2</sub>e; total electric power sector emissions for the state were 16.3 MMtCO<sub>2</sub>e. *Statewide Greenhouse Gas Emissions Level: 1990 Baseline and 2020 Business as Usual Projection Update* (Jul. 2016), Appendices C (Massachusetts Annual Greenhouse Gas Emissions Inventory: 1990-2013 with Partial 2014 Data) and P (2013 Emissions from Electricity Consumed in Massachusetts) (the “MA GHG Inventory”).

<sup>8</sup> Individual facility caps should be allocated pro rata based on the ratio of each facility’s actual three-year (2013-2015) average emissions to the sum of all capped electric generating facilities’ actual three-year average emissions over the same period such that the sum of all such individual facility caps equals the total annual aggregate cap necessary to comply with *Kain*. Individual facility caps should be recalculated and re-set in 2035 by the same method. If a capped facility retires between 2018 and 2035, it may transfer its cap allocation to a new facility (i.e., one that was not existing at the time 310 C.M.R. 7.77 became effective).

<sup>9</sup> 5.77 MMtCO<sub>2</sub>e, the difference between that sub-sector’s 2013 emissions (12.52 MMtCO<sub>2</sub>e) and the sub-sector’s required 2020 emissions (6.75 MMtCO<sub>2</sub>e).

MMtCO<sub>2</sub>e lower (i.e., more stringent) than DEP has proposed. DEP should also reject the idea of an additional 1MMtCO<sub>2</sub>e new facilities emissions allocation because it unfairly raises the cost of GWSA compliance for businesses and families in the Commonwealth: inflating the state emissions inventory to allow new facilities to emit penalizes the owner/operators of existing in-state power plants without justification by requiring them to reduce their own emissions up to 30% more than would otherwise be required in order to accommodate the entrance into the local power markets of major new emitters.<sup>10</sup>

- (3) ***Emissions Caps Should be Reset in 2035*** – Individual facility caps should initially be allocated pro rata based on the ratio of each facility’s actual three-year (2013-2015) average emissions to the sum of all capped electric generating facilities’ actual three-year average emissions over the same period such that the sum of all such individual facility caps equals the total annual aggregate cap necessary to comply with *Kain*. The aggregate cap and corresponding individual facility caps should be recalculated and re-set in 2035 by the same method for the period 2035 - 2050. If a capped facility retires between 2018 and 2035, it should be allowed to transfer its capped emissions allocation to a new facility (i.e., one that was not existing at the time 310 C.M.R. 7.77 become effective) provided that the new facility has a lower emissions rate (BACT lbs. CO<sub>2</sub>/MWh) than the retiring facility; no such allocation transfer should be allowed after 2035.
- (4) ***New Facility Emissions from Over-Compliance Credits Only*** – Recognizing that there are potential efficiency gains that newer fossil generating facilities can bring over the long run, the proposed 310 C.M.R. 7.77 emissions cap should not include an outright ban on the operation of new gas-fired electric generating facilities in the Commonwealth. However, for the same reasons that DEP must reject a new, separate allocation for new facility emissions, the proposed 310 C.M.R. 7.77 emissions cap should allow new facilities to emit CO<sub>2</sub> only to the extent they are in possession of valid, same-year over-compliance credits created by/obtained from existing in-state facilities (or some or all of the emissions cap allowance of a retired existing facility).
- (5) ***In-State Cap Should Cover Large Waste-to-Energy Plants*** – Equity, efficiency, and the atmosphere demand that DEP include the state’s large waste-to-energy power plants in the proposed 310 C.M.R. 7.77 emissions cap. At least five such

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<sup>10</sup> Under DEP’s current proposal, 23 in-state generators would be required to reduce their emissions from about 12.06 MMtCO<sub>2</sub>e in 2013 to 7.71 MMtCO<sub>2</sub>e in 2020 in order to allow for up to 1 MMtCO<sub>2</sub>e of new facility emissions beginning in 2018, a reduction of 4.35 MMtCO<sub>2</sub>e. Without the new facility emissions inflation, the same plants under DEP’s current proposal would only need to achieve a 3.35MMtCO<sub>2</sub>e reduction in the same time-frame. A similar disparity exists with the more stringent 6.75 MMtCO<sub>2</sub>e aggregate cap required in order to comply with *Kain*.

facilities emit as much fossil CO<sub>2</sub> or more (collectively, about 1 MMtCO<sub>2</sub>e annually) than the twenty-three EPA Air Markets Program reporters that the proposed regulation currently targets. And by including large waste-to-energy power plants (i.e., those that emit 50,000 tons or more per year of fossil CO<sub>2</sub>), DEP would further reduce the regulatory burden and associated cost of the proposed 310 C.M.R. 7.77 emissions cap by another 25% (by spreading required annual emissions reductions across twenty-nine rather than just twenty-three facilities) while also increasing the potential coverage, and thus efficiency, of the over-compliance credit trading market.

(6) ***Over-Compliance Credits Valid Only in the Year They Are Produced*** – As DEP has publicly recognized, the proposed 310 C.M.R. 7.77 emissions cap is not an economic incentive or emissions-trading program, but rather a GWSA enforcement mechanism required in order to comply with *Kain*’s legal mandate. As such, the regulation must ensure that the program’s actual volumetric emissions caps are met annually. To do so, the program should not allow multi-year banking of over-compliance credits (“OCCs”) by any facility, existing or new. Although OCCs should be tradable among regulated facilities in order to allow the state’s large electricity-producing facilities to most efficiently meet the aggregate cap at lowest total cost, they should be valid only in the year in which they are produced to ensure that each annual aggregate volumetric emissions cap is in fact met.<sup>11</sup> This is critically important for the year 2020—as the *Kain* court recognized, the GWSA requires that actual emissions that year (rather than emissions plus OCCs) shall be no greater than 70.8 MMtCO<sub>2</sub>e.<sup>12</sup>

(7) ***New 310 C.M.R. 7.77 Should Be Self-Financing*** – Capping large in-state electricity producers while allowing the production and trading of OCCs will create economic incentives and opportunities that can be expected to result in a cleaner and cheaper electricity supply for the Commonwealth as electricity generation shifts to favor the cleanest-per-dollar power producers in the state. As a result, OCCs will have real and increasingly substantial economic value. A portion of that newly created value should properly accrue to the Commonwealth via an OCC trading charge in order to fund the administration of new program as well as, potentially, other DEP *Kain*-compliance efforts.

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<sup>11</sup> Limiting the validity of OCCs to the year in which they are produced will have little, if any, effect on the ability of covered facilities to trade and rely on OCCs as EPA Air Markets Program emissions data for at least 23 of the 29 facilities covered by the proposed 310 C.M.R. 7.77 emissions cap is available quarterly and online.

<sup>12</sup> Multi-year OCCs would similarly create serious, on-going uncertainty for the Commonwealth regarding its ability in any year to meet future mandatory GWSA milestone emissions caps. Such uncertainty would also likely undermine the state’s ability to design and implement other necessary, and complementary, GWSA implementation policies and programs.

- (8) ***New 310 C.M.R. 7.77 Should Continue Through 2050*** – A clean electric power supply is critical not only to the health of the Commonwealth but also to the Commonwealth’s ability to meet its economy-wide GWSA mandate for 2050. As a result and to give certainty to the markets, which will help us efficiently reach our goals, DEP should impose declining emissions-reduction requirements on in-state electric generating facilities equivalent to at least a rate of decline of 2.5% each year through 2050.

As stated above, it is imperative that DEP demonstrate that its rulemaking will result in new emissions reduction sufficient to ensure that the Commonwealth meets its 2020 GWSA mandate. If all of those emissions reductions are enforceable only through the proposed new 310 C.M.R. 7.77 cap (as has, in practice, been proposed), the aggregate cap must be significantly lower than DEP has proposed. However, to the extent DEP does not artificially inflate the regulation’s emissions cap to accommodate proposed new power plants, the cap must only be 0.96 MMtCO<sub>2</sub>e lower than that proposed for existing in-state facilities. Alternately, DEP could impose enforceable declining caps elsewhere sufficient to obtain about 1 MMtCO<sub>2</sub>e. Based on calculations in the state’s current *Joint Statewide Three-Year Electric and Gas Energy Efficiency Plan*, it appears reductions on that order could be obtained by requiring gas and electric utilities to achieve in their next joint plan (for 2019 – 2021) a doubling of their current levels of energy efficiency implementation.<sup>13</sup>

#### New 310 C.M.R. 7.75

CLF applauds DEP’s inclusion of a new Clean Energy Standard (“CES”), to be enacted pursuant to Section 3(c) of the GWSA, as part of this rulemaking and responds to each DEP issue of concern as follows:

- (1) ***CES Should Commence Immediately and Extend to 2050*** – Given the pressing mandate of *Kain* and the GWSA, the CES should commence immediately and should remain in place through 2050 with annual CES requirements beginning in 2018 and set for subsequent years so as to ensure the Commonwealth is served by 100% clean energy by 2050 at the latest, and earlier if/as feasible and cost-effective.
- (2) ***CES Obligation Should Include Municipal Light Plants*** – Particularly given their exclusion from otherwise mandatory state RPS and energy efficiency

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<sup>13</sup> Analysis prepared for the state’s Energy Efficiency Advisory Council indicates that additional energy efficiency measures are currently available under the state’s existing “all cost-effective” standard. To the extent energy efficiency measures beyond that were required in order to achieve implementation rates sufficient to obtain a reduction of about 1 MMtCO<sub>2</sub>e, such measures could and would be justified as “lowest-cost avoided carbon” GWSA-compliance measures.

programs, the CES must be applied (as DEP’s current draft regulation would do) to the state’s Municipal Light Plants (“MLPs”) which together produce or deliver about 15% of the state’s electric power and related emissions. The GWSA applies to all emitters in the Commonwealth, and the burden of emissions reductions should be shared equally by all in-state electricity customers.<sup>14</sup>

(3) ***CES Eligibility Should be Limited to Newly Qualified Generators Only*** – For the same reasons that led to the REC-qualification date for the Commonwealth’s Renewable Portfolio Standard, and to avoid resource shuffling and windfall profits,<sup>15</sup> the state’s conceptually similar CES credits should be available only to qualified generation built on or after the effective date of new 310 C.M.R. 7.75.

(4) ***CES-Qualified Generators Must be 2050-Compliant / Zero Emissions*** – Experience and best-available 2050 modeling<sup>16</sup> dictate that the Commonwealth must reasonably expect that every new electric generating facility built from today onward will be part of the state’s 2050 electric power system. As a result, new generation built to fulfill the CES must emit at or below a level consistent with the average CO<sub>2</sub> per megawatt-hour levels required in a 2050 GWSA-compliant electric power system, which best-available science indicates is about *three times lower* than the “50% of gas-fired combined cycle plant” emissions level proposed by DEP.<sup>17</sup> As a result, unless and until DEP adopts an evidence-based 2050-compliant positive emissions rate for Massachusetts, the CES should define qualifying “clean energy” as energy with zero GHG emissions, that is

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<sup>14</sup> Given the varied generation and import portfolios of MLPs across the state, individualized compliance schedules in the first five years following program implementation may be appropriate. However, by 2025 at the latest, in-state MLPs obligation under the CES should match the combined RPS and CES obligation of all other retail electricity suppliers through 2050.

<sup>15</sup> See MassDEP, *Background Information and Technical Support Document for: 310 CMR 7.75 Clean Energy Standard* (Jan. 2, 2015), at 5; accord Stanton et al., *A Clean Energy Standard for Massachusetts* (Oct. 25, 2013), at 8-11.

<sup>16</sup> See, e.g., Williams et al., *Pathways to Deep Decarbonization in the United States* (Nov. 2014), available at: <http://usddpp.org/downloads/2014-technical-report.pdf>; accord The White House, *United States Mid-Century Strategy for Deep Decarbonization* (Nov. 2016), available at: [https://www.whitehouse.gov/sites/default/files/docs/mid\\_century\\_strategy\\_report-final.pdf](https://www.whitehouse.gov/sites/default/files/docs/mid_century_strategy_report-final.pdf).

<sup>17</sup> The average gas-fired combined cycle plant emits about 890 lbs. CO<sub>2</sub> per megawatt-hour of electricity produced; in order to reach economy-wide emissions reduction of 80% of 1990 levels, average electric power sector emissions in 2050 will have to be on the order of about 125 lbs. CO<sub>2</sub>/MWh, see Williams et al., *Pathways to Deep Decarbonization in the United States*.



RPS-eligible or nuclear generation.<sup>18, 19</sup>

- (5) ***No Alternative Compliance Payments Should be Allowed*** – As with the proposed cap on in-state electricity producers, the CES is being instituted primarily as a GWSA compliance tool, rather than as an economic incentive program. The program’s primary goal, then, must be to ensure that the state meets its annual volumetric emissions goals. In the absence of a well-designed system in which, for example, alternative compliance payments are structured and invested so as to achieve avoided-equivalent, in-state emission reductions within the same year, allowing covered entities to pay money in lieu of reducing actual GHG emissions defeats that purpose. To the extent additional tools (such as an economy-wide cap-and-trade program or effective in-state offsets) might be needed to help the Commonwealth meet its GWSA obligations at lowest cost, those should be considered separately as DEP continues to implement the state’s climate law.

Sincerely,



David Ismay  
Senior Attorney  
Conservation Law Foundation

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<sup>18</sup> This definition would allow low-impact/run-of-river hydropower to generate CES credits but would generally prohibit power from large newly-flooded boreal reservoir hydropower, which has average lifetime emissions of between 160 and 250 lbs.CO<sub>2</sub>/MWh. *See, e.g.,* Steinhurst et al., *Hydropower Greenhouse Gas Emissions: State of the Research* (Feb. 14, 2012), at 2, from doing so. As the CES is designed to provide an incentive for the construction and procurement of new generation beyond that which is already expected, there is no conflict between this definition and H.4568 (July 31, 2016).

<sup>19</sup> Any subsequent determination by DEP qualifying an electricity source or category of electricity sources as “clean energy” for purposes of the CES should be conducted as part of an open and transparent public rulemaking proceeding pursuant to G.L. c. 30A.

November 16, 2016

**By Electronic Mail ([climate.strategies@state.ma.us](mailto:climate.strategies@state.ma.us))**

Commissioner Martin Suuberg  
Department of Environmental Protection  
1 Winter Street  
Boston, MA 02108

**Subj: Initial Comments re: GWSA Section 3(d) Regulations  
For Non-Electric Power Sector Emitters**

Dear Commissioner Suuberg,

Conservation Law Foundation (“CLF”) appreciates and applauds the active commitment you and your department have demonstrated towards ensuring that the Commonwealth complies with the Global Warming Solutions Act (“GWSA”) following the court’s decision in *Kain v. Department of Environmental Protection*, 49 N.E. 3d 1124 (Mass. 2016). The Section 3(d) and other regulations the Department of Environmental Protection (“DEP”) has proposed thus far are an excellent and encouraging start, and we strongly agree with DEP that these regulations should be designed to reduce emissions not just through 2020, but until we reach our overall GWSA mandate in 2050. We also commend DEP on its efforts to involve stakeholders across the state in this rulemaking which it has conducted, to date, with notable openness and transparency.

In continuing to develop DEP’s proposed *Kain*-compliance rulemaking, please consider and incorporate the following comments regarding the rulemaking overall, and regarding DEP’s proposed regulations for the transportation sector and distribution system gas leaks, in particular:

**Rulemaking Must Demonstrate Compliance with *Kain***

Although DEP has GWSA authority to regulate emissions beyond 2020—something we strongly encourage it to do—this rulemaking must at a minimum “ensure that [GWSA’s] legally mandated reductions are realized by the 2020 deadline” in accordance with *Kain*.<sup>1</sup> As a result, the rulemaking must include legally enforceable,

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<sup>1</sup> *Kain v. Department of Environmental Protection*, 49 N.E. 3d 1124, 1142 (Mass. 2016) (“The purpose of G.L. c. 21N is to attain actual, measurable, and permanent emissions reductions in the Commonwealth, and

declining annual volumetric emissions caps that are sufficient to ensure that the Commonwealth's emissions are less than or equal to the equivalent of 70.8 million metric tons of carbon dioxide ("MMtCO<sub>2</sub>e") in 2020.<sup>2</sup> While DEP has some discretion in articulating its methodology for achieving that goal, its discretion is not unbounded and must be supported by publicly-available, substantial evidence.

To that end, DEP's rulemaking must include a detailed explanation, with supporting quantitative analysis, of how the proposed new (and revised) regulations will be enforced, and how they will collectively work over their first three years to guarantee 2020 emissions of 70.8 MMtCO<sub>2</sub>e or less in light of the Commonwealth's most recent comprehensive assessment<sup>3</sup> of the ability of existing programs and policies to deliver that volumetric mandate. Importantly, DEP's supporting analysis must fully account for – and its regulations must resolve—the "significant risk" identified by the Secretary of Energy and Environmental Affairs that, even if the state's existing regulatory structure is fully implemented, the Commonwealth's 2020 emissions may be as high as 76 MMtCO<sub>2</sub>e, or about 5% above the 2020 volumetric cap.<sup>4</sup>

Finally, DEP must ensure that each regulation it will rely on to ensure that the Commonwealth's emissions are less than or equal to 70.8 MMtCO<sub>2</sub>e in 2020 is immediately and meaningfully enforceable and, to protect the 2020 viability of the rulemaking effort, DEP should require that every agency, department, board, commission, and instrumentality of the Commonwealth must not issue any permit, license, or other administrative approval or decision, or make any grant of funds for any activity, that would interfere with, threaten, or prevent the Commonwealth's achievement of that mandate.

### **Proposed Transportation Sector Regulations**

CLF applauds DEP's inclusion of enforceable declining annual emissions caps in the transportation sector as part of this Section 3(d) rulemaking. Achieving meaningful,

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the Legislature included § 3 (d) in the statute to ensure that legally mandated reductions are realized by the 2020 deadline.").

<sup>2</sup> As the state has previously determined, that volume of emissions is equivalent to a 25% reduction in state-wide emissions compared to the Commonwealth's 1990 emissions level, the legally enforceable emissions limit the GWSA specifies for the calendar year 2020.

<sup>3</sup> *Massachusetts Clean Energy and Climate Plan for 2020* (Dec. 31, 2015) (the "2015 CECP").

<sup>4</sup> *Id.* at 11 ("[T]here is a significant risk that the total amount of reductions realized in 2020 will be less than 25%, compared to the 1990 emissions."); *accord id.* at 13 (Table 3). As the 2015 CECP makes clear, the potential variability in predicting the state's 2020 emissions is due to a number a factors beyond the lack of required Section 3(d) annual emissions caps including, but not limited to uncertainty regarding: the weather, implementation of federal vehicle standards and their effect in Massachusetts, and the availability and timing of potential future low-emissions electricity imports. *See id.* at 13-15.



permanent reductions in this sector must quickly become a main focus of the state's GWSA compliance effort.

#### Revised 310 CMR 60.05

Regarding the proposed revision to 310 CMR 60.05, it is CLF's understanding that DEP intends to calculate aggregate carbon dioxide ("CO<sub>2</sub>") emissions from the transportation sector each year based on the transportation network model currently used to calculate carbon monoxide and ozone precursors. We appreciate that the travel demand model may currently be the tool most accessible to DEP as it is regularly used by the Central Transportation Planning Staff ("CTPS"). Unfortunately, the travel demand model is not the appropriate tool for this task.

Travel demand models were developed after World War II, as cities were suburbanizing, for a different purpose. They were created to predict where traffic congestion would occur and indicate where roads should be widened. Starting in the 1980s these models were also used to help plan large-scale transit expansions. But travel demand models were not built to address many 21st century issues, including accurately measuring greenhouse gas ("GHG") reductions. One critical problem with the travel demand model is that it does not account for short trips in any detail, so it is not particularly useful, for example, in assessing the value of bicycle and pedestrian infrastructure, including first- and last-mile connections to transit, or connectivity between homes and other nearby land uses. As such, demand models are inherently biased toward the types of large regional-scale projects they were designed to consider, and they have less value in planning and developing the kinds of efficiency improvements to a mature system that can reduce travel demand and associated emissions and costs.

Fortunately, better models for calculating CO<sub>2</sub> emissions are now available,<sup>5</sup> and we strongly urge DEP and MassDOT to use them in order to calculate aggregate CO<sub>2</sub> emissions from the transportation sector for purposes of GWSA compliance. One set of such models is based on an empirical accessibility analysis, i.e., the observed time it takes individuals to reach destinations on all four modal networks (foot, bicycle, rail, and vehicle). These models are fully scalable—equally valid for considering a regional rail project or a local bike path—and by comparing accessibility across modes, these models can reliably predict mode share and vehicle miles travelled (or "VMT"). Importantly, this functionality allows decision-makers to understand the likely impacts from transportation and land-use decisions, including those that are invisible to conventional

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<sup>5</sup> An off-the-shelf empirical accessibility model called Sugar Access has recently been made available by Citilabs. For evaluating specific transportation policy ideas, the Federal Highway Administration's Energy and Emissions Reductions Policy Analysis Tool (EERPAT), a different kind of model may also be useful.

travel demand models such as the one referenced by DEP in its October 28, 2016 stakeholder discussion slides.<sup>6</sup>

#### New 310 CMR 60.06

Regarding DEP's proposed new 310 CMR 60.06 regulation, CLF encourages DEP to set aggressive targets that maximize emissions reductions from the Commonwealth's vehicle fleet by 2020. To that end, CLF urges the Baker Administration to show strong, nation-leading leadership-by-example by committing to transition the state's light-duty passenger fleet to 100% zero-emissions vehicles (ZEVs) by 2020, with overall emissions levels (for all state vehicles) that in the aggregate meet or exceed by 2020 those expected as a result of the framework described by S.2505 (passed by the Senate on Nov. 10, 2016).<sup>7</sup> Similarly, CLF encourages DEP to set declining annual emissions caps comparable to those it will set in 310 CMR 60.06 on other in-state fleets (e.g., MA registered/licensed ride share, livery, taxi, and commercial delivery vehicles).

#### **Proposed Gas Leaks Regulation**

CLF applauds DEP's intention to regulate methane emissions from the Commonwealth's gas distribution system (new 310 CMR 7.73), and strongly encourages it to establish emissions caps at least through 2034, if not beyond: Methane is a potentially destructive GHG and recent peer-reviewed studies indicate that Massachusetts' aging distribution infrastructure is leaking at a rate well in excess of the national average.

In order to effectively implement and enforce the proposed cap, however, DEP must establish an accurate baseline of existing system emissions, and also implement a uniform and accurate system of leak detection and leak measurement that accounts for the "in-ground" reality of our statewide system. To that end: DEP must re-examine and update according to best-available science the Commonwealth's existing method of estimating gas distribution system GHG emissions for the years 1990 to present;<sup>8</sup> and, to the extent such factors are incorporated into the new regulation, use empirically derived and regionally-specific activity factors ("AFs") and emissions factors ("EFs") in place of

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<sup>6</sup> See Slide Deck 3 (GWSA - GreenDOT), at 7.

<sup>7</sup> Available at <https://malegislature.gov/Bills/189/S2505>.

<sup>8</sup> A wealth of leading scientific expertise is locally available to DEP for this purpose, see note 9 below, as are state-of-the-art, commercially available detection systems, see, e.g., Picarro Surveyor™ (<http://www.picarrosurveyor.com/>).

“industry” or nationally-derived data.<sup>9</sup> Additionally, DEP must incorporate mechanisms to verify emissions reductions with on-the-ground measurements and monitoring.<sup>10</sup>

Finally, DEP should coordinate its regulations with the Department of Public Utilities (“DPU”) to immediately prohibit, prevent, and penalize as part of 310 CMR 7.73 the practice of unregulated gas leak “venting.” To the extent a known leak must be vented in order to ensure the public’s immediate safety, DEP’s new regulations should require that such venting be immediately reported to DEP and DPU and immediately monitored and repaired as a Grade 1 leak in accordance with G.L. c. 164, § 144(b)(2).

Sincerely,



David Ismay  
Senior Attorney  
Conservation Law Foundation

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<sup>9</sup> Information regarding Massachusetts-specific EF and AF metrics is readily available to DEP from Boston University (*see* Hendrick MF, Ackley R, Sanaie Movahed B, Tang X, Phillips NG. 2016. *Fugitive methane emissions from Leakprone natural gas distribution infrastructure in urban environments*. Environmental Pollution. 213:710716. doi: 10.1016/j.envpol.2016.01.094; Phillips NG, Ackley R, Crosson ER, Down A, Hutyra LR, Brondfield M, Karr JD, Zhao K, Jackson RB. 2013. *Mapping urban pipeline leaks: methane leaks across Boston*. Environmental Pollution. 173:14. doi:10.1016/j.envpol.2012.11.003; McKain K, Down A, Raciti SM, Budney J, Hutyra LR, Floerchinger C, Herndon SC, Nehrkorn T, Zahniser MS, Jackson RB, Phillips N, Wofsy SC. 2015. *Methane emissions from natural gas infrastructure and use in the urban region of Boston, Massachusetts*. Proceedings of the National Academy of Sciences. 112(7):19411946. doi: 10.1073/pnas.1416261112), Harvard University (*see* Lamb BK, Edburg SL, Ferrara TW, Howard T, Harrison MR, Kolb CE, Townsend Small A, Dyck W, Possolo A, Whetstone JR. 2015. *Direct measurements show decreasing methane emissions from natural gas local distribution systems in the United States*. Environmental Science and Technology. 49(8):51615169. doi: 10.1021/es505116p), the Environmental Defense Fund (Environmental Defense Fund / Google Earth Outreach, *Natural Gas: local Leaks Impact Global Climate*. <https://www.edf.org/climate/methanemaps>), and HEET with the MAPC (HEET and MAPC, *Fixing Our Pipes: Coordinating Natural Gas Main Replacement*. <http://fixourpipes.org/>).

<sup>10</sup> Here, too, DEP should consider requiring the use of state-of-the-art, commercially available detection systems (*see* note 8 above).

**From:** Edward Kaczinski  
**Sent:** Monday, November 21, 2016 10:39:31 PM (UTC-05:00) Eastern Time (US & Canada)  
**To:** Strategies, Climate (DEP)  
**Subject:** GHG Section 3d Comments

(From the Massachusetts Municipal Wholesale Electric Company)

We are requesting that the DEP revisit the stringent CO2 caps that are being proposed for the electric generation sector under 310CMR7.77.

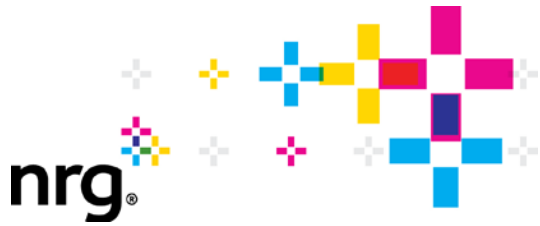
The proposed 2018 310CMR7.77 GHG emissions cap is 8,119,126 metric tons for existing electric generation facilities and 1,000,000 metric tons for new facilities. The proposed total 2018 cap of 9,119,126 metric tons of GHG emissions is 64% lower than the 1990 baseline of 25.6 million metric tons for electric generation as stated in a document entitled, "Statewide GHG Emissions Levels: 1990 Baseline and 2020 Business As Usual Projection" published by the Massachusetts EOEAA/DEP on July 1, 2009. (Back calculating the data in the 11/7/2016 presentation results in a 1990 baseline of 15.6 million metric tons and the proposed 2018 cap is a 42% reduction from the baseline which also significantly exceeds the GWSA goal).

The Global Warming Solutions Act has a goal of a 25% reduction by 2020. The proposed regulation will result in a 69% reduction by 2020 for the electric generation sector when using the data in the EOEAA/DEP publication. Furthermore, an annual 2.5% reduction will result in total GHG emissions reduction of 93% by 2050.

The electric generation facilities sector has taken a leading role in reducing GHG emissions even though it is not the largest producer of GHG emissions in Massachusetts. The sector has significantly exceeded the GWSA goals to date because of the replacement of inefficient coal and oil-fired generation with ultra-efficient gas-fired and renewable generation. Because of the intermittent nature of renewable generation, it is necessary to integrate fast starting ultra-efficient gas-fired generation with renewables to maintain system stability and reliability.

To ensure that the growth of renewable generation is necessarily supported by fast-start gas-fired generation, we are requesting that the establishment of the 2018 cap be revisited.

To be on track with the goals of the GWSA, the 2018 electric generation sector cap should be set at 19.6 metric tons.



Shawn Konary  
NRG Energy, Inc.  
One International Place  
Boston, Massachusetts 02110

November 21, 2016

Mr. Martin Suuberg  
Commissioner  
Massachusetts Department of Environmental Protection  
One Winter Street  
Boston, Massachusetts 02108

Delivery: [climate.strategies@state.ma.us](mailto:climate.strategies@state.ma.us)  
[martin.suuberg@state.ma.us](mailto:martin.suuberg@state.ma.us)

**Subject: Comments on Stakeholder Discussion Draft Regulations 310 CMR7.77  
Reducing Greenhouse Gas Emissions from Electric Generating Facilities Program**

Dear Commissioner Suuberg:

NRG Energy, Inc. (NRG) is a Fortune 200 energy company, supporting clean energy resources and technologies critical to our transition to a sustainable, low-carbon society. NRG Energy's diverse power generation facilities have a capacity of over 50,000 MW, capable of providing energy services to nearly one third of the U.S. population. NRG retail electricity providers serve nearly 3 million retail customers. NRG Energy's indirect subsidiary NRG Canal LLC owns and operates the existing 1,200 nominal MW Canal Generating Station in the Town of Sandwich. NRG Energy's indirect subsidiary, NRG Canal 3 Development LLC is proposing to construct a new 350 MW electric generation facility (Canal 3), at Canal Generating Station.

NRG appreciates the opportunity to participate in the Massachusetts Department of Environmental Protection (MassDEP) stakeholder outreach sessions and to provide comments on the stakeholder discussion draft regulations under the Global Warming Solutions Act (GWSA). Moreover, given the complexity of the subject matter involved, and the interplay between the important goals of reduction of Greenhouse Gasses (GHG) and ensuring a reliable supply of electricity in the Commonwealth of Massachusetts, NRG commends MassDEP for soliciting stakeholder input during the development process of the regulations, before the draft regulations are issued for formal public comment. Accordingly, NRG is pleased to offer its thoughts on MassDEP's stakeholder discussion draft *310 CMR 7.77 Reducing Greenhouse Gas (GHG) Emissions From Electricity Generating Facilities Program* (the "Draft").

In summary, NRG is extremely concerned that the proposed allocations to the electric power sector are too low to represent recent and anticipated operational levels, will impair the ability of ISO-NE to dispatch the bulk electric system reliably, and will effectively forestall development of new, more efficient generation within the Commonwealth. NRG recommends that the aggregate allocation to existing resources be no lower than the 2014 actual sector emissions, and that the allocation to new resources be at least large

enough accommodate the three resources that are currently under development, at levels consistent with their approved or anticipated emission caps. Lastly, NRG recommends that the final regulations provide for a retiring generator to apply its cap allocations directly to repowering projects.

## 1. General

The GWSA authorizes MassDEP to regulate *all* sources of GHG emissions in the Commonwealth. Despite this broad authorization, the regulations seek to achieve GHG reductions almost exclusively from the electric power generating sector. Given this sector's massive historic successes in already reducing GHG emissions and the underperformance of other GHG emitting source sectors in reducing GHG, MassDEP's overreliance on the power generation sector to meet GWSA goals is neither fair nor appropriate.

According to data compiled by the United States Energy Information Administration (EIA), Massachusetts in-state power plants contributed only 16.9% of CO<sub>2</sub> emissions in Massachusetts in 2014. In fact, these EIA data show that Massachusetts power plants CO<sub>2</sub> emissions have declined dramatically from 1990 levels – 58% reduction in CO<sub>2</sub> from power plants from 1990 levels. Accordingly, this sector has already contributed more than its share in achieving the GWSA goal of achieving a 25% reduction of 1990 CO<sub>2</sub> emissions by 2020.

In contrast, GHG reductions have not been seen across other, large GHG-emitting economic sectors. For example the Transportation sector has not reduced CO<sub>2</sub> emissions since 1990. 2014 emissions from transportation were essentially the same as 1990 level.

Given the power sector's impressive actual GHG reductions to date, and the accompanying lack of progress in other important GHG-emitting sectors, it is not reasonable to target this sector to achieve, almost exclusively, the Commonwealth's economy-wide GWSA goals, especially given the harm to cost, regional emissions and reliability that will result. The EIA data show that overall, Massachusetts has reduced GHG emissions by 24% from 1990 levels as of 2014. This leaves only 1%, or roughly 0.8 million tons/yr, of GHG reduction to meet the 2020 targets. Given the dramatic decreases in emissions in the electric sector to date, MassDEP should ensure that new regulations secure incremental near-term emission reductions from sectors that have lagged behind, particularly transportation.

## 2. Proposed GHG Cap on Existing Facilities

As currently drafted, the proposed aggregate GHG emission cap on existing facilities threatens ISO-NE's ability to meet energy demand, and will increase costs and regional emissions. According to available data,<sup>1</sup> in 2015 the actual electricity generated across existing facilities in Massachusetts was 24,203,295 megawatt hours (MWh). The aggregate CO<sub>2</sub> emissions from these existing Massachusetts facilities in order to generate this power was 12,257,601 metric tons.

Under 310 CMR 7.77 sections (4)(a), 4(b), and Table A of the Draft, the 2018 cap on aggregate CO<sub>2</sub> emissions from existing facilities would be set at 8,119,484, the sum of the individual facility emissions caps listed in Table A.<sup>2</sup> Thus, based on 2015 data, in order even to meet the 2018 cap, existing facilities would have to reduce their aggregate CO<sub>2</sub> emissions by 3.3 million tpy. In order to achieve this reduction

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<sup>1</sup> See Joint Comment Letter of NRG and Footprint Power, submitted of even date ("Joint Comments").

<sup>2</sup> It should be noted that this sum is slightly larger than the 8,119,126 cap one would derive by simply subtracting the proposed 1 million tpy cap on new facilities from the proposed aggregate for the sector of 9,119,126. NRG recommends that as part of the development of the final regulations, DEP share its data sources and its proposed calculations and methodologies to establish cap levels.

in GHG emissions, the Existing Facilities would have to reduce their electric generation by approximately 27 % as well, which would necessarily shift the production of these 6,500,000 MWh to facilities in neighboring states under the ISO-NE regional dispatch control.

By limiting the energy output of in-state energy generation facilities, the proposed caps are likely to negatively impact reliability and the cost of electricity in Massachusetts and the New England region. Massachusetts is part of the regional Independent System Operator (ISO)-New England power grid. ISO-NE operates a centralized economic dispatch, meaning that they call for output from the lowest-cost resources first; these tend to be the most efficient units and also the lowest emitters of greenhouse gases. Curtailing electric generation in Massachusetts will result in dispatching less efficient generating stations in New England and neighboring States, not subject to such operating restrictions, outside of the Commonwealth, which will raise costs for all New England consumers and will increase GHG across the region as a whole. In addition, reliability will be impaired because the limitations that the CO<sub>2</sub> emission caps will impose will result in Massachusetts plants being unavailable in some hours when the ISO-NE would normally call on them for economic or reliability purposes. Finally, the proposed cap will restrict the availability of on-line load following and off-line peaking resources' ramping capacity needed for integration and operation zero or no carbon variable resources.

Accordingly, NRG recommends that the aggregate cap on existing facilities for 2018-2020 should be at least as high as the 2014 actual sector emissions (according to EIA, ~10.8 MMT) with the small incremental reductions to meet the economy-wide 2020 target derived from other sectors.

### 3. Proposed GHG Cap on New Facilities

The proposed allocation of 1 MMT for all New Facilities is woefully inadequate to support the necessary development of new, more efficient generating facilities in Massachusetts that will be needed to effectively integrate the wind, solar and other renewables that will form the basis of the Commonwealth's energy supply in the coming decades. As described in Joint Comments, the three facilities currently in development in Massachusetts have approved or provisional emissions that total approximately 4 MMT, and the final regulations should not ignore that these facilities are exactly the type of highly flexible and responsive generation that will be needed to operate a more dynamic grid and integrate increasing amounts of variable energy resources. The initial allocation for New Facilities should not be less than the estimated approximately 4 MMT needed for these resources to operate consistent with their designs and anticipated operational profiles, and in accordance with ISO-NE's reliance on these units for reliability. If, as NRG suspects, other sectors could yield several more tons of reductions, the electric sector cap could be increased accordingly to accommodate these flexible, economic and reliable new units. This approach would level the playing field somewhat among the sectors and would reduce the reliability and cost risks on the ISO-NE system as compared to the levels proposed by MassDEP.

The other inevitable consequence of the proposed small allocation to New Facilities is that there will likely be no further development of conventional generation within Massachusetts. The proposed mechanism in the Draft by which a retiring generator would immediately surrender its emission allocation, to be allocated pro-rata across all other facilities, creates a major hurdle and disincentive for a retiring generator to seek to repower with a new, more flexible and more efficient technology. Instead, NRG recommends that a retiring generator have continued rights to its cap allocation to apply to a repowering project or transfer to another project. Such an approach will need to account for potential hoarding or other actions that could stymie, rather than promote, efficient development of new, flexible generation in the Commonwealth. NRG looks forward to making more detailed proposals and working with the DEP in developing these rules.

4. The proposed GHG Emission Cap on Canal Generating Station is too low.

The proposed 2018 Individual facility GHG Emissions Cap set forth in Table A of the Draft, is purported to represent actual facility operating conditions in the recent past, 2013-2015. At a minimum, NRG recommends using 2014 and another more representative operating year, at least as applied to the Canal Station, to avoid using anomalous data from 2013 and 2015, when the Station experienced two extended outages that significantly reduced its output. Specifically, during 2013 Canal Generating Station experienced extremely unusual operational circumstances including unplanned outages resulting in the Unit 1 GSU being out of service for the entire 2013 calendar year and one of the Unit 2 GSUs being out of service from July 2013 – December 2013. In 2015 Canal Unit 2 experienced an extended outage from February to June. Together, the unplanned outages reduced plant availability and operations by ~60 to 70+%.

Accordingly, NRG energy recommends that MassDEP revise the proposed Canal Generating Station's individual 2018 GHG emissions cap. The Canal Generating Station 2018 cap should be at least 300,316 tpy, which is based on actual GHG emissions in year 2014 (300,316 metric tons), which better reflects recent actual operations.

5. The Proposed Regulations Cannot and Should Not Impose a Declining Cap on GHG Emissions Beyond the Year 2020

Section 16 of the GWSA states as follows:

The department of environmental protection shall promulgate regulations pursuant to subsection (d) of said section 3 of said chapter 21N not later than January 1, 2012, which regulations shall take effect on January 1, 2013, and *shall expire on December 31, 2020*.

St. 2008, c. 298, §16 (emphasis added). Under the plain language of this section, MassDEP is not authorized to regulate sources under subsection 3(d) beyond 2020. Thus, as the proposed 310 CMR 7.77 regulations would be promulgated by Mass DEP pursuant to Section 3(d) of the GWSA, the regulations must expire at the end of 2020.

Indeed, this Legislative limit reflects the understanding that there is extreme uncertainty as to the future GHG emissions in the Commonwealth and how best to achieve reduction goals. As a practical matter, given the extreme uncertainty, the regulations are and should be an iterative process and reduction goals beyond 2020 should be set and periodically updated based on actual and best available data.


Accordingly, NRG recommends that MassDEP follow the directive of the GWSA that GHG reductions not be established past 2020. This will give MassDEP and market participants the ability to fully assess and understand the challenges associated with meeting the GWSA GHG reduction goals in 2020 before setting further binding limits in the years beyond. Based on this actual data and experience, MassDEP will be in a much better positions to consider how future declining GHG emissions rates (across the universe of GHG emitting sources) should best be addressed to meet the future GWSA GHG reduction goals.

Again, NRG appreciates the opportunity to comment on these draft regulations and looks forward to further dialog and working with the MassDEP on the next round of drafts. Due to the extremely short time frame available to review the regulations and data, NRG will continue to review the many data sources used to analyzed this important rulemaking, and will provide further thoughts and comments during the review process.



If you have any questions, or require any additional information, please contact me at (617) 529-3874 or [shawn.konary@nrgenergy.com](mailto:shawn.konary@nrgenergy.com).

Sincerely yours,

A handwritten signature in black ink, appearing to read "Shawn Konary", is written over a light gray rectangular background.

Shawn Konary  
Environmental – East Region

Copies:           W. Stone  
                      File

## **PILGRIM WATCH COMMENT ON REDUCING GHG EMISSIONS UNDER SECTION 3(D) OF THE GLOBAL WARMING SOLUTIONS ACT (November 2, 2016)**

Pilgrim Watch (“PW”) is a non-profit citizen’s organization that serves the public interest on issues regarding the Pilgrim Nuclear Power Station specifically and on nuclear power in general. The organization is in Duxbury, Massachusetts. Its membership extends throughout the Commonwealth.

Pilgrim Watch does not support current or any future nuclear reactors qualifying as eligible clean energy generators. They have been feeding at the trough long enough to the detriment of consumer prices, the environment and development of truly clean energy alternatives. The proposed standard properly does not propose to include existing generators in the CES, even if they meet the emissions-based threshold; but DEP improperly backtracked and is re-reviewing this in 2016.

### **Eligible Clean Technologies**

#### ***The Clean Energy Standard should not allow nuclear power plants to qualify***

Including Nuclear plants defeats the purpose of the CES as shown by MassDEP’s commissioned Synapse Study. The purpose of the CES is to achieve the following:

- A CES would provide a long-term incentive to deliver increasing amounts of clean electricity to consumers in Massachusetts.
- The CES would ensure ongoing progress toward reducing greenhouse gas emissions by 80% by 2050, as required by the Massachusetts Global Warming Solutions Act of 2008.
- The CES would address the Clean Energy Performance Standard strategy in the Massachusetts Clean Energy and Climate Plan for 2020.
- A CES would complement other clean energy strategies to reduce the price increases and volatility associated with our dependence on fossil fuels, grow clean energy jobs, and improve the environment.

MassDEP commissioned a report from Synapse Energy Economics in 2013<sup>1</sup> in order to prepare its draft regulation. It showed that including nuclear in the CES would provide windfall profits to nuclear facilities; not result in a change in regional emissions; increase customer’s utility bills; and allow reactors to continue to operate by providing them with yet another subsidy.

Specifically the report showed:

The likely outcome of including nuclear generation in a CES would be windfall profits to nuclear facilities. Providing rewards to nuclear plants will not increase nuclear generation in New England. With nuclear facilities assigned CECs, there is no change in regional emissions, but residential customers nonetheless see their utility bills

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<sup>1</sup> <http://www.mass.gov/eea/docs/dep/air/climate/ces-report.pdf>

grow by 4 percent in 2020 and 6 percent in 2030 with respect to the Reference Case (see Table ES-1 (Synapse, pg., 4))

**Table ES-1. CES Delta Bill Impacts: Includes Nuclear and Includes MLPs**

Delta Massachusetts Typical Monthly Bills (2013\$)			
% change from Reference Case	2015	2020	2030
Residential	0%	4%	6%
Commercial	0%	4%	6%
Industrial	0%	5%	7%

**Table ES-2. CES Delta Bill Impacts: Excludes Nuclear and Includes MLPs**

Delta Massachusetts Typical Monthly Bills (2013\$)			
% change from Reference Case	2015	2020	2030
Residential	0%	6%	10%
Commercial	0%	6%	9%
Industrial	0%	7%	10%

**Table ES-3. CES Delta Bill Impacts: Excludes Nuclear and MLPs**

Delta Massachusetts Typical Monthly Bills (2013\$)			
% change from Reference Case	2015	2020	2030
Residential	0%	7%	11%
Commercial	0%	7%	11%
Industrial	0%	8%	12%

The remaining scenarios shown in this report assume that MLPs will comply with CES. Table ES-4 displays the base result: nuclear generation is excluded from receiving CECs; MLPs are required to comply; and the CEC threshold is set at 2,000 lbs/MWh. In this scenario, LSEs must be required to hold CECs for 73 percent of their sales in 2020 and 82 percent in 2030 in order to achieve a 5.5 million sT target emission reduction. Residential customers' monthly utility bills rise by 6 percent with respect to the Reference Case in 2020 and 10 percent in 2030.

Further, Synapse showed that the **"CES Does Not Reduce Emissions If Nuclear Power is Assigned CECs.** Assigning CES credit to existing nuclear generation adds 30,000 CECs to the Policy Case." Pgs., 14-15. CES compliance can be satisfied with no change in dispatch or investment in new resources, and, therefore, no reduction in emissions (see Table 4). The simple reason for this is that because reactors are large units, they would receive numerous credits. The credits in turn could be sold to the dirtiest polluters to enable them to continue operating "business as usual" spewing carbon into the air

Table 4. CES Delta Results: Includes Nuclear and MLPs; Threshold = 1,700 lbs/MWh; Share of Sales = 100%

Delta Emissions				
		2015	2020	2030
New England CO <sub>2</sub> Emissions (including imports)	1000 sT	0	0	0
Massachusetts Consumption CO <sub>2</sub> Emissions	1000 sT	0	-7,472	-7,201
Massachusetts Consumption CO <sub>2</sub> Emissions Rate	lbs/MWh	0	-241	-227
Delta New England Costs				
		2015	2020	2030
Supply	GWh	0	0	0
Fuel Costs	M\$	0	0	0
CO <sub>2</sub> Costs	M\$	0	0	0
VOM Costs	M\$	0	0	0
Variable Costs of All Resources	M\$	0	0	0
Variable Costs of All Resources	\$/MWh	0.0	0.0	0.0
Variable Costs of Marginal Resource	\$/MWh	0.0	0.0	0.0
Wholesale Energy Price	\$/MWh	0.0	0.0	0.0
Net RPS Requirement	GWh	0.0	0.0	0.0
REC Price	\$/MWh	0.0	0.0	0.0
Total RPS Cost	M\$	0.0	0.0	0.0
Total RPS Cost per MWh Sales	\$/MWh	0.0	0.0	0.0
Net CECs Requirement	GWh	No Policy	52,527	48,340
CECs Price	\$/MWh		18.4	28.3
Total CES Cost	M\$		966.5	1,367.0
Total CES Cost per MWh Sales	\$/MWh		15.6	21.6
Delta Massachusetts Typical Monthly Bills (2013\$)				
% change from Reference Case		2015	2020	2030
Residential		0%	9%	13%
Commercial		0%	9%	12%
Industrial		0%	10%	14%

Synapse concludes (at 15) that, **“Even though no actual emission reduction is stimulated in this scenario, residential customers see their utility bills grow by 9 percent in 2020 and 13 percent in 2030** with respect to the Reference Case. The likely outcome of including nuclear generation in a CES would be windfall profits to nuclear facilities. Providing rewards for nuclear generation will not prompt the construction of new nuclear facilities in New England (due to regulatory, cost, and political hurdles), although it may serve to prolong the life of existing facilities. The remaining scenarios shown in this report assume that existing nuclear generation will not be assigned CES credit.”

Providing existing or new nuclear reactors with CESs would provide a huge supply of credits to allow the dirty polluters to continue operating and spewing carbon into the atmosphere. Providing CES credits would breathe new life into the nuclear industry placing citizens at risk-all it takes is one bad day and despite the probability of an accident the consequences are too great as Fukushima showed- and adding to the stockpile of nuclear wastes that remain lethal for thousands of years and have no permanent storage solution.

**The Standard should continue to not allow existing Generators to receive credits**

The proposed standard properly did not propose including existing generators in the CES, even if they meet the emissions-based threshold. The Technical Support Document for the standard explains why

First, including existing generators could result in “resource shuffling.” (Resource shuffling, as documented in the Synapse study, refers to the shifting of contractual arrangements to reflect additional clean energy purchases without any corresponding change in generation or emissions.) Second, including existing generators would result in “windfall profits” for some or all existing generators, and associated costs to ratepayers. (Windfall profits, as discussed in the Synapse study, are profits that result when already profitable activities, such as continued operation of existing power plants, are subsidized at ratepayer expense.) Third, existing ownership and contractual relationships between MLPs and existing low and zero-emissions generators may complicate options for addressing existing generators. Fourth, as noted above a large number of stakeholders objected to including existing nuclear power plants in the CES.

DEP did an about face. The most recent technical document says that, “MassDEP is proposing a regulatory requirement for MassDEP to review options for addressing existing low and zero-emissions generators in the CES in 2016.” This is bad policy. The only apparent reason for the change of heart or “re-review” of the issue were comments submitted primarily by Entergy and Exelon There should be no change.

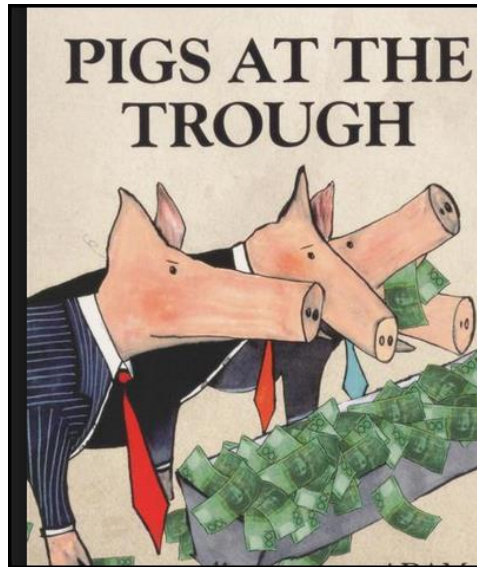
First Massachusetts can meet its carbon reduction goals without changing course and including existing nuclear plants. Massachusetts plan will bring considerable carbon-free energy to Massachusetts-hydropower from Canada, solar is growing, and expanding the state’s net-metering program would allow homeowners and businesses to get credit for extra solar power they supply to the electric grid will spur more solar development. Offshore wind, whose price has dropped in recent years, is set to become a real option for the region. Investing in new electrical transmission to Massachusetts will allow access to much large amounts of wind and hydro power at competitive prices. Entergy efficiency has made considerable strides also.

According to the Union of Concerned Scientists’ President Ken Kimmell, “Some projections estimate as much as 2,000 megawatts of wind can be developed in the region and another 2,000 megawatts of hydropower could be imported into the state. Doing so could save consumers \$600-900 million a year. This would more than make up for the loss of energy from Pilgrim, for example, (690 megawatt capacity), and enable Massachusetts to meet its carbon reduction obligation for 2020 and beyond.” There is no need to reverse course.

PW does not support current or any future nuclear reactors qualifying as eligible clean energy generators. They have been feeding at the trough long enough to the detriment of consumer prices, the environment and development of truly clean energy alternatives

### Is It Fair to Exclude existing or future nuclear reactors In MassDEP's Clean Energy Credits?

Exelon's and Entergy's comments to the Draft CES boiled down to complaints that "It's not fair" to exclude nuclear reactors from the CES. But, what is not fair is that clean energy sources have not received the subsidies that nuclear power has received for decades and continues to get.



**Nuclear power has and continues to receive huge subsidies;** and it still cannot make money in market economies. Nuclear reactors make rates higher than they should ever be. First, the industry received massive subsidies at its inception, reducing both the capital costs it needed to recover from ratepayers (the "legacy" subsidies that underwrote reactor construction through the 1980s) and its operating costs (through ongoing subsidies to inputs, waste management, and accident risks). Second, when industry restructuring revealed that nuclear power costs were still too high to be competitive, so-called stranded costs were shifted to ratepayers, allowing the reactors to continue operating. Pilgrim's stranded costs exceeded one billion dollars and allowed Entergy to buy Pilgrim for a song. In addition to legacy subsidies, the industry continues to benefit from subsidies that offset the costs of uranium, insurance and liability, plant security, cooling water, waste disposal, and plant decommissioning.

Despite the unequal subsidies for nuclear reactors, they still cannot make it in market economies. It is time to level the playing field and give a lift to energy sources that are truly clean, cheaper, and reliable, and create jobs for Massachusetts.

Nuclear power should not be eligible for inclusion in a renewable portfolio standard. Nuclear power is an established, mature technology with a long history of government support. Furthermore, nuclear plants are unique in their potential to cause catastrophic damage (due to

mechanical or human error, sabotage, or terrorism); it produces very long-lived radioactive wastes with no forwarding address; and it exacerbates nuclear proliferation.

Respectfully submitted,  
Mary Lampert  
Pilgrim Watch, director  
November 2, 2016



Meghan Leahy  
Director, Legislative and Regulatory Affairs  
19 Charles Street  
Charlestown, MA 02129  
meghan.leahy@NEE.com  
617.320.9883

November 21, 2016

By Electronic Mail: climate.strategies@state.ma.us

Department of Environmental Protection  
Commonwealth of Massachusetts  
One Winter Street  
Boston, Massachusetts 02108

**Re: Clean Energy Standard Implementation Options**  
**GHGs from Electricity Generators Regulations**

Ladies and Gentlemen:

With appreciation for the opportunity to comment and for the Department's on-going work to fashion efficient and effective programs and policies, NextEra Energy Resources (NEER) is pleased to provide comments in response to two invitations from the Department:

1. stakeholder input on a discussion draft of regulations for Reducing Greenhouse Gas (GHG) Emissions From Electricity Generating Facilities Program, including related to certain, highlighted key policy and technical issues; and
2. stakeholder feedback on options for implementing a Clean Energy Standard (CES), including on all its aspects but with focus on certain, specified substantive differences from the 2015 CES proposal.

NEER also remains available at the Department's convenience to provide any additional policy, technical, operational or financial information or analysis related to its existing facilities or its experience in other jurisdictions or with similar programs and policies.

\* \* \*

To provide some context for these comments, I note that NEER is widely recognized as one of the nation's leading clean energy providers. As of April 30, 2016, NEER's portfolio of facilities in the United States and Canada totals more than 18,200 megawatts of generating



capacity in the United States and Canada. The vast majority of NEER's electricity generation is derived from clean or renewable sources.

### **GHGs from Electricity Generators Regulations**

NEER's interest in the Department's regulation of GHG reductions from electricity generation facilities principally arises from its ownership and operation of NEER's natural gas combined-cycle facility in Bellingham, one of 23 facilities expected to be affected by this regulation.

It also bears noting that NEER supports the comments provided on this regulation by the New England Power Generators Association (NEPGA), of which NEER is a member.

Beyond the NEPGA comments, NEER has certain, specific concerns about the methodology for determining affected unit mass emission limits (tonnage cap) and the corresponding emission limits proposed for NEER's Bellingham facility. In particular, NEER notes that basing emission limits on the 2013-15 annual average emissions unduly constrains the Bellingham facility.

To explain, it may be useful first to present the past five years' annual emissions data:

<u><b>Year</b></u>	<u><b>CO<sub>2</sub> Emissions (tons)</b></u>
2011	309,499
2012	196,870
2013	134,070
2014	215,699
2015	572,549

As can be seen, there has been substantial variation over the past five years, with the years 2013 and 2014 among the lowest. Over the next ten years, it is projected that market conditions (including coal plant retirements and low natural gas fuel prices) will cause energy and capacity from NEER's Bellingham facility to become more economically attractive and thereby increase production.

Consequently, while the assigned emission limit for Bellingham is an unrepresentatively low 265,478 tons, the projected market demand (reflecting strong need for affordable electricity) is expected otherwise to result in annual average CO<sub>2</sub> emissions of 569,467 tons, as is represented by the 2015 emissions data, which first reflect the projected future market conditions.

If this discrepancy between a proposed emission limit of less than half of projected emissions is not resolved, NEER will likely be forced either to curtail operations by as much as half of otherwise projected output or to obtain Over Compliance Credits (assuming they are available), also for about half of projected output. The consequence may be material, not just for NEER as facility owner/operator, but for the electricity market: under the first scenario, there may be

impacts on the capacity market or peak demand energy pricing; and, under the second scenario, there will likely be impacts on baseload energy pricing.

To address this concern, NEER recommends that the Department base the mass-based emission limits for existing affected sources on either of two alternative approaches. The more equitable approach for all existing affected sources bases the limits on each facility's highest annual emissions over the 2013-15 period, with each facility's limits reduced *pro rata* if and to the extent the sum of these limits exceeds the aggregate cap of 9.1 million tons to be established for existing units. An alternative approach, if the Department has countervailing considerations that render this approach unacceptable, bases the limits on the average of the three highest years over the past five years; while less equitable than the first approach, this has been used successfully by EPA in its transport rule cap-and-trade programs as it lessens some of the arbitrariness attributable to market and other factors outside the control of the regulated entities.

As noted above, NEER will make its staff and advisors available if useful to the Department's on-going consideration of the methodology or other program aspects for GHG reductions for electricity generating facilities.

### **Clean Energy Standard Implementation Options**

NEER's interest in the Department's implementation of the Clean Energy Standard principally arises from its majority ownership and operation of NEER's approximately 1,200 megawatt nuclear generating facility in Seabrook, New Hampshire, the majority of energy output from which is sold into the market serving Massachusetts consumers (including several municipal utilities in Massachusetts that hold minority ownership in the facility).

While NEER may have opinions on the questions listed by the Department in its request for stakeholder input, it respectfully suggests that the most important issue for NEER happens to be that which is likely most important for Massachusetts ratepayers and citizens seeking a clean environment and affordable electricity.

Given the evolving technological and economic marketplace for clean energy generation, it seems transcendentally important for the Clean Energy Standard to be fundamentally founded on emission thresholds, rather than listed technologies.

An approach based on emission thresholds has the benefit of creating an incentive for all generators – existing, proposed, and those still to come – to get the regulatory benefits that come from reducing their emissions to the greatest practical extent. The result will mean not only that low or zero emission generators will qualify but that at least some facilities – now or in the future – may qualify if they are willing and able to cause their emissions to reach qualifying levels as a result of facility improvements or new technological innovations.

Moreover, an approach like that presently under consideration – based on listed technologies – runs the obvious risk of becoming outdated not long after adoption, thus precluding technologies either not yet invented or not yet improved from qualifying, despite the fact that they might contribute beneficially to the achievement of the Commonwealth’s clean energy goals. And, as a negative corollary to the benefits of the emission threshold approach, a technologies list does not create an incentive for generators to seek ever better ways of improving their emissions profile.

As a separate matter, NEER also respectfully suggests that the Clean Energy Standard becomes most effective if it does not include artificial dates or other bases for the exclusion of existing facilities. In particular, it is appropriate for eligibility to extend to any facility remaining in operation from and after the effective date of the Clean Energy Standard, regardless of its initial commercial operation date. Based on NEER’s understanding, this change will not materially affect the overall incentive for new clean energy facilities (because it will extend eligibility to only a limited number of existing facilities). It will, however, remove the inadvertent, arbitrary and counter-productive exclusion of certain, economically and environmentally efficient and effective facilities capable of meeting the otherwise applicable standards. In this way, the Clean Energy Standard can more easily avoid the pitfall of picking winners and losers (or favored technologies or facilities) and, instead, march forward to serve the shared goal of clean energy for all.

As noted above, NEER will make its staff and advisors available if useful to the Department’s on-going consideration of the eligibility criteria or other program aspects for the Clean Energy Standard.

\* \* \*

NEER appreciates the opportunity to comment on the proposed new greenhouse gas rule and the clean energy standard at this early stage of the rulemaking. If you have any questions regarding our comments please contact Meghan Leahy at the information listed below.

Sincerely,

/s/Meghan Leahy

Meghan Leahy

Director

Legislative and Regulatory Affairs

NextEra Energy Resources

cc: R.J. Lyman, ML Strategies, LLC

**From:** Steve Lissauskas

**Sent:** Wednesday, November 16, 2016 5:14:52 PM (UTC-05:00) Eastern Time (US & Canada)

**To:** Strategies, Climate (DEP)

**Subject:** GHG Section 3d Comments

US EPA has estimated the following sources of GHG emissions in the United States:

Consumption of goods and food: 42%

Lighting and heating/cooling of buildings: 25%

Local passenger transport: 15%

Other passenger transport: 9%

Appliances/devices: 8%

Infrastructure: 1%

<https://www.epa.gov/climatechange/climate-change-and-waste> (accessed 11/15/16)

Massachusetts has appropriately set aggressive limits to reduce greenhouse gas emissions. We need to reduce GHGs by 25% by 2020 and by 80% by 2050. DEP's excellent work has already produced significant reductions in GHGs, but each future ton of GHG reduction becomes harder than the last, especially when we are trying to squeeze massive additional GHG reductions out of a limited pool of GHG generation.

We may be able to achieve the 2020 limits with the current focus on electricity, natural gas and the comparatively small fleet of state-owned vehicles. Significant expense will be required to undertake many of these reduction efforts. Largely untapped, however, is the GHG reduction that can be achieved by increasing recycling and appropriate food waste diversion.

More than half of the material in our trash each year can be easily reused, recycled or composted. This material has a much higher value in these markets compared to landfilling or incinerating them. Appropriately diverting these materials can significantly reduce GHGs associated with materials extraction, manufacturing and materials transportation. These GHG reductions are similar to those from electricity generation; some may occur out-of-state, but they are directly related to consumption decisions in Massachusetts, and therefore should be considered as potential offsets to GHG generation from waste disposal activities in the Commonwealth.

In addition to reducing GHGs, improved materials management can be achieved at no cost while also saving money for cities or towns. Compare the two alternatives – pursuing difficult and expensive reductions in areas where significant efforts have already been made, or pursuing reductions in an area we have not focused on, where progress will be comparatively easier, less expensive, and will create jobs while helping communities save money.

I urge DEP to focus on achieving GHG reductions with improved materials management; leaving 42% of GHG emissions off the table will increase the difficulty and cost of meeting the GWSA requirements. Please consider adding solid waste reduction, recycling and composting to your sectors of consideration and prioritize action to reduce GHGs in these areas.

**Stephen P. Lisauskas**  
Vice President



(c) 617-821-5933

30 Massachusetts Avenue, 4<sup>th</sup> Floor  
North Andover, MA 01845

**From:** cathy Loula

**Sent:** Wednesday, November 16, 2016 3:24:08 PM (UTC-05:00) Eastern Time (US & Canada)

**To:** Strategies, Climate (DEP)

**Subject:** DEP HEARING COMMENTS

Hi,

I'm submitting my comments in regard the Executive order regarding GWSA.

The Executive Order is an important and welcome first step. We appreciate it. The Governor has reaffirmed that climate change is a serious threat and that the Administration intends to meet the requirements of the GWSA.

That said, the Executive Order is not enough. Right now, we are **not** on track to hit the 2020 emissions reductions mandated by the GWSA. The Global Warming Solutions Act targets are not aspirational. They are legally required. The Supreme Judicial Court has ruled that the state has an obligation to put regulations in place that ensure we close the gap and achieve compliance by 2020.

We need specific plans and accurate accounting to ensure that the regulations created by the DEP get us to 25% below 1990 levels by 2020.

The current Clean Energy and Climate Plan (CECP) includes many key policies/programs intended to achieve compliance, but we are lagging in meeting 2020 targets and in implementing many of the measures contained in the plan.

Similarly, the new clean energy procurements included in the omnibus bill (hydro and offshore wind) are critical to helping MA transition to clean energy over the coming decades. But because those resources will not come online until after 2020, they will not help us meet the GWSA requirements.

We demand that you rapidly reduce green house gas emissions in the interest of protecting our children's and everyone's future. Gas leaks and new gas infrastructure should be a focus of these reductions. Fix the distribution system! Fix the super emitters! The Department of Environmental Protection should issue regulations that extend beyond 2020 on methane emissions to ensure continued reduction. DEP should also partner with independent researchers to help define "leaks of significant environmental impact." The administration should also factor GWSA impacts into decision making related to siting of new generation facilities and pipelines. Continuing to pursue new gas infrastructure is at odds with our need to comply with the GWSA.

Sincerely,

E. Catherine Loula, MD





MASSACHUSETTS  
INTERFAITH POWER & LIGHT

14 Collins Rd., Waban, MA 02468 • 617-244-0755 • [www.MIPandL.org](http://www.MIPandL.org)

November 17, 2016

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Commissioner Martin Suuberg  
Massachusetts Department of  
Environmental Protection  
One Winter St.  
Boston, MA 02108

Dear Commissioner Suuberg,

Massachusetts Interfaith Power & Light's mission is to work in covenant with our 240 faith community members in more than 100 Massachusetts cities and towns to provide a faith based response to climate change.

Allow me to make a few brief points in support of the aggressive implementation of Governor Baker's Executive Order 569 Establishing an Integrated Climate Change Strategy.

First we emphasize as the Supreme Judicial Court (SJC) noted, that achieving a 25% reduction in greenhouse gas emissions from 1990 levels by 2020 is a legal mandate and not a goal. Secondly the recognition that the international goals of the 2015 Paris accords, are inadequate makes it even more important that states like Massachusetts act boldly to provide an example of leadership for other states and subnational political entities.

Additionally, the mandate recognized by the SJC is a **mandate for the entire state**, not just the Department of Environmental Protection. We urge Governor Baker to **order all state agencies**, including the Department of Energy Resources, the Department of Transportation and the Department of Housing and Community Development to implement regulations necessary to meet or exceed the required 25% reduction.

Over the past fourteen years we have helped many houses of worship achieve reductions of carbon dioxide emissions greater than 50% and as high as 70%. We urge Massachusetts to establish the most aggressive reductions possible. Such actions will protect the health of the citizenry from air pollution and reduce the economic damage from extreme weather events and rising sea levels.

Sincerely,

Vince Maraventano, M.Div., J.D.  
Executive Director  
[vince@MIPandL.org](mailto:vince@MIPandL.org)



**From:** Raffi Mardirosian

**Sent:** Sunday, November 13, 2016 10:00:19 AM (UTC-05:00) Eastern Time (US & Canada)

**To:** Strategies, Climate (DEP); Shah, Sejal (DEP)

**Subject:** Clean / Low Carbon Fuel Standard in MA

Hi all,

I have been reviewing the GWSA Section 3d compliance planning materials on the MA Energy and Environmental Affairs website, with a particular interest in the transportation sector. I am wondering why MA has not taken leadership on a Low Carbon Fuel Standard like CA and OR. I see there was a discussion about a regional Clean Fuels Standard several years ago, with no action since. In my (admittedly cursory) review of the plans on the table to decarbonize the transport sector here, I have seen no plans that would provide a material reduction in emissions. A Clean Fuels Standard would be an effective way of achieving climate targets and also spurring local job creation in the biobased economy via production of low carbon fuels.

I would like to register my strong opinion that a transport policy agenda that prioritizes (1) a clean fuels standard to reduce the carbon intensity of our fuels, and (2) electrification of our vehicle fleet, as these are going to be the strongest potential vectors for impact.

It still seems indeterminate if ridesharing services will increase or decrease emissions (savings from sharing vehicle miles amongst more people vs drop in public transport services & increase in vehicle miles as cost of transport drops), so the need for action as we may have some forces working against us.

NOTE: I have a clear personal interest in such a law being enacted as I work for a low carbon fuels technology company (Joule), but this is also the source of my knowledge on and passion for the topic and study of the regulations in other states. We did a study at Joule on the future of sustainable mobility and opportunities for impact that would be happy to share.

On a personal note, I would be happy to get involved as a private citizen volunteer if helpful, if the election last week taught us one thing, it is that we need more engagement in public service even amongst those for whom it is not a primary professional endeavor.

best,

Raffi Mardirosian

Cambridge resident

**From:** Daria Mark

**Sent:** Wednesday, November 16, 2016 4:49:37 PM (UTC-05:00) Eastern Time (US & Canada)

**To:** Strategies, Climate (DEP)

**Subject:** Methane gas leaks

Dear Massachusetts Department of Environmental Protection,

The Executive Order is an important and welcome first step. We appreciate it. The Governor has reaffirmed that climate change is a serious threat and that the Administration intends to meet the requirements of the GWSA.

That said, the Executive Order is not enough. Right now, we are **not** on track to hit the 2020 emissions reductions mandated by the GWSA. The Global Warming Solutions Act targets are not aspirational. They are legally required. The Supreme Judicial Court has ruled that the state has an obligation to put regulations in place that ensure we close the gap and achieve compliance by 2020.

We need specific plans and accurate accounting to ensure that the regulations created by the DEP get us to 25% below 1990 levels by 2020.

The current Clean Energy and Climate Plan (CECP) includes many key policies/programs intended to achieve compliance, but we are lagging in meeting 2020 targets and in implementing many of the measures contained in the plan.

Similarly, the new clean energy procurements included in the omnibus bill (hydro and offshore wind) are critical to helping MA transition to clean energy over the coming decades. But because those resources will not come online until after 2020, they will not help us meet the GWSA requirements.

We demand that you rapidly reduce green house gas emissions in the interest of protecting our children's and everyone's future. Gas leaks and new gas infrastructure should be a focus of these reductions. Fix the distribution system! Fix the super emitters! The Department of Environmental Protection should issue regulations that extend beyond 2020 on methane emissions to ensure continued reduction. DEP should also partner with independent researchers to help define "leaks of significant environmental impact." The administration should also factor GWSA impacts into decision making related to siting of new generation facilities and pipelines. Continuing to pursue new gas infrastructure is at odds with our need to comply with the GWSA.

Thank you,

Daria Mark

# No Sharon Gas Pipeline

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Department of Environmental Protection  
One Winter Street  
Boston, MA 02108

November 15, 2016

To whom it may concern,

We're very concerned with methane emissions, especially coming from all the leaks in gas pipelines. First, thanks to the Department of Environmental Protection (DEP) for proposing regulations on methane emissions and for extending regulations beyond 2030.

Unfortunately, there are problems with the methodology for determining emissions. The DEP proposal is also likely to discount *superemitter* leaks and perhaps underestimate total methane emissions.

The DEP should require verifiable, empirical measurements to ensure real emission reductions so urgently needed. The DEP should also consider regulations on gas venting, storage and other sources of unwanted methane emissions.

Thank you for your consideration and, hopefully, implementation of these suggestions.

Sincerely,  
Bri McAlevey, *for NSGP*

**From:** Bridget McCaffrey

**Sent:** Wednesday, November 16, 2016 8:40:56 AM (UTC-05:00) Eastern Time (US & Canada)

**To:** Strategies, Climate (DEP)

**Subject:** Gas leaks

Hello,

I am writing to express my concern about the number of gas leaks that have gone unattended by the utility companies in Massachusetts.

Recently it has come to my attention that there are at least 177 natural gas leaks in the town of Arlington alone and approximately twenty thousand statewide.

The methane from the natural gas leaks is bad for our health, bad for the plant life around us, adds to the warming of the planet and could pose a safety hazard. Also, we, the consumers, are the ones paying for lost and unaccounted for gas.

For all these reasons, we need strict regulations to ensure that the gas companies fix all gas leaks. Identifying and fixing the largest leaks (the "super-emitters") should happen as soon as possible, but we also want all other gas leaks fixed in a timely manner.

Sincerely,  
Bridget McCaffrey  
Arlington, MA

**From:** Michael McCord

**Sent:** Wednesday, November 16, 2016 2:28:21 PM (UTC-05:00) Eastern Time (US & Canada)

**To:** Strategies, Climate (DEP)

**Subject:** <no subject>

TO: Department of Environmental Protection

FROM: Green Committee  
Neighborhood Association of Back Bay (NABB)

DATE: November 16, 2016

Thank you for the opportunity to provide comments on the DEP's proposed regulations about methane emissions.

I am writing to you today on behalf of the Green Committee of the Neighborhood Association of the Back (NABB) in support of the letter sent to you by Dr. Nathan Phillips, Dr. Margaret Cherne-Hendrick, and Dr. Lucy Hutyra, scientists from the Department of Earth and Environment at Boston University. We are asking that the DEP use informed and verifiable data for both the baseline and cap emissions measures so that we can be sure that emissions are actually going down and it's not just an accounting exercise with estimates that may or may not be valid.

We share the concerns stated in the letter from Drs. Phillips, Cherne-Hendrick, and Hutyra:

“ In order for the DEP to meet the requirements set out in the Global Warming Solutions Act and Governor Baker's Executive Order, it is imperative that the DEP's GHG inventory, baseline year, and proposed caps be informed and verifiable. Otherwise, it will be very difficult to determine if proposed caps are effective in reducing CH<sub>4</sub> emissions in MA, and/or if the DEP's GHG inventory accurately reflects the magnitude of the climate impact made by the State's leaking natural gas distribution systems. In addition to the significant climate benefits that accomplishing these measures will confer, it will also increase stakeholder trust and ensure that ratepayer money is being spent intelligently. We hope that our comments help to guide the DEP towards achieving this common goal.”

We appreciate your consideration of our comments.

Sincerely,

Michael McCord  
Green Committee, Chair

# Developing a Renewable Biofuel Option for the Home Heating Sector

A Report to Congress,  
State Governments  
and Administrator of the  
Environmental Protection  
Agency

MAY, 2015



## EXECUTIVE SUMMARY

Pursuant to Public Law 113-79 (the Agricultural Act of 2014), Congress required the National Oilheat Research Alliance (hereinafter “Alliance”) to prepare a report on the utilization rate and analysis of the use of biofuels in Oilheating equipment.

- One of the biggest **transitions in heating oil** has been the move to **ultra-low sulfur heating oil** (ULSHO). This fuel lowers maintenance, **improves efficiency** and **reduces pollution** from heating systems.
- **Biodiesel blends at 20% (B-20)** with **ultra-low sulfur** heating oil (ULSHO) are **lower in Greenhouse Gas Emissions (GHG) than natural gas** when evaluated over 100 years, while blends of 2% (B-2) or more are lower in GHG than natural gas when evaluated over twenty years.
- **Biodiesel blended at 5 percent** would **require** approximately **300 million gallons of biodiesel produced per year**. Assuming the biodiesel industry average of 50 million gallons per year per plant, **Bioheat®** would be responsible for **6 plants** built and continuously operated. Thus, nearly **270 full time** jobs can be directly attributed to Bioheat®.
- Studies on the operation of **Bioheat®** on the basic burner operation with biodiesel blends at **B-20** (at least) is **the same as with unblended heating oil**
- NORA (the Alliance) and the National Biodiesel Board (NBB) have **communicated the value** of using biodiesel and selling Bioheat®. The Alliance features information about Bioheat® on its consumer website, **OilheatAmerican.com**. The NBB has a webpage, **Bioheatonline.com** that describes the advantages of Bioheat®. Further, the Alliance and its affiliated state associations have worked to **provide education** on this product to consumers and retail oil companies through the use of mass media and informational brochures.
- **State and local governments** have utilized a number of strategies to encourage the use of biofuels in their communities. It is often necessary to **encourage its use** with **incentives or mandates** to develop the infrastructure and overall market acceptance for a new fuel.

## I. BACKGROUND AND INFORMATION ABOUT NORA

Pursuant to Public Law 113-79 (the Agricultural Act of 2014), Congress required the National Oilheat Research Alliance (hereinafter “Alliance”) to prepare a report on the utilization rate and analysis of the use of biofuels in Oilheating equipment. In addition to the utilization rate, the report was to provide information on the environmental benefits, economic benefits, and any technical limitations on the use of biofuels in oilheat fuel equipment, as well as describe market acceptance of the fuel. The report and information contained therein would be disseminated to the Federal Government as well as State and local governments that are encouraging the use of biofuels in oilheat fuel utilization equipment

The Alliance was established to, among other things, assist the heating oil industry develop more efficient products; improve training and develop best practices in the industry; provide product information to residential and commercial customers about oilheat and help homeowners and small business owners improve the energy efficiency of their homes and businesses when using oilheat. The Alliance has been working for over a decade to assist in the development of biofuels for the fuel oil industry. Increasingly, fuel customers are demanding a more environmentally sustainable fuel oil and renewable content is essential part of meeting that demand.

Regarding its work to date, the Alliance has primarily focused its work on the viability and utilization of biodiesel in the fuel oil industry. The Alliance’s focus on Biodiesel/ Bioheat® has been a cooperative endeavor between the Alliance and the National Biodiesel Board (NBB). Both organizations are supportive of expanding the market presence of a renewable fuel in the heating oil sector.

To achieve this goal, the organizations have worked on a number of key projects:

- **Fuel validation and utilization** Research has been conducted at Pennsylvania State University, Brookhaven National Laboratory (BNL) and Underwriters Laboratory (UL) on blends of biodiesel and heating oil. UL studies were limited to 5 percent blends, while the other organizations evaluated higher blends, up to B-20. The studies have not identified problems in the operation of the higher blends. However, some manufacturers of small fuel pumps have indicated that elastomers and seal materials should be replaced if a blend over 5 percent is used.
- **Fuel properties and characteristics:** The Alliance and NBB have conducted a significant amount of outreach and education with fuel distributors, their employees, and fuel oil service professionals who are installing and assisting with the maintenance of fuel oil appliances in residential homes and light-commercial facilities. Biodiesel blends provide added lubricity and a higher, safer flash point than conventional fuel oils, while having higher cold flow properties and slightly higher viscosity. There are ongoing initiatives, especially with blends over B20, to further study fuel properties and impacts as a complete understanding of fuel oil properties is essential for safety, soundness, and efficiency of its use.
- **Field testing:** The Alliance and NBB have conducted follow-on research of field results of using biodiesel blended with conventional heating oil. This has involved surveys of Bioheat® distributors, equipment analysis, and reviews of particular companies using biofuels.



## Description of the Heating Oil Market (Residential and Commercial)

The heating oil market is well established in 23 states represented by the Alliance.

These states include:

<b>Connecticut</b>	<b>Delaware</b>	<b>Idaho</b>
<b>Indiana</b>	<b>Kentucky</b>	<b>Maine</b>
<b>Maryland</b>	<b>Massachusetts</b>	<b>Michigan</b>
<b>Nevada</b>	<b>New Hampshire</b>	<b>New Jersey</b>
<b>New York</b>	<b>North Carolina</b>	<b>Ohio</b>
<b>Oregon</b>	<b>Pennsylvania</b>	<b>Rhode Island</b>
<b>South Carolina</b>	<b>Vermont</b>	<b>Virginia</b>
<b>Washington</b>	<b>Wisconsin</b>	

Heating oil has a very strong market share in many of the New England states such as Maine, Vermont and New Hampshire as heating oil has traditionally provided a very economical way to meet the heating needs of homes, multi-family dwellings, and small businesses. Additionally, the portability of the fuel provides for easy transport to homes and businesses that are in more remote locations, which aren't serviceable from other grid infrastructure.

Heating oil is distributed by thousands of small businesses, the majority of which are family owned. Heating oil retailers generally make four deliveries to a household per year, and typically provide on-going service and maintenance of the fuel oil appliances in the home or business.

## II. ENVIRONMENTAL BENEFITS OF BIODIESEL

### Air Emissions Criteria Air Pollutant Emissions Assessment

(NO<sub>x</sub>, SO<sub>2</sub>, CO, PM<sub>2.5</sub>)

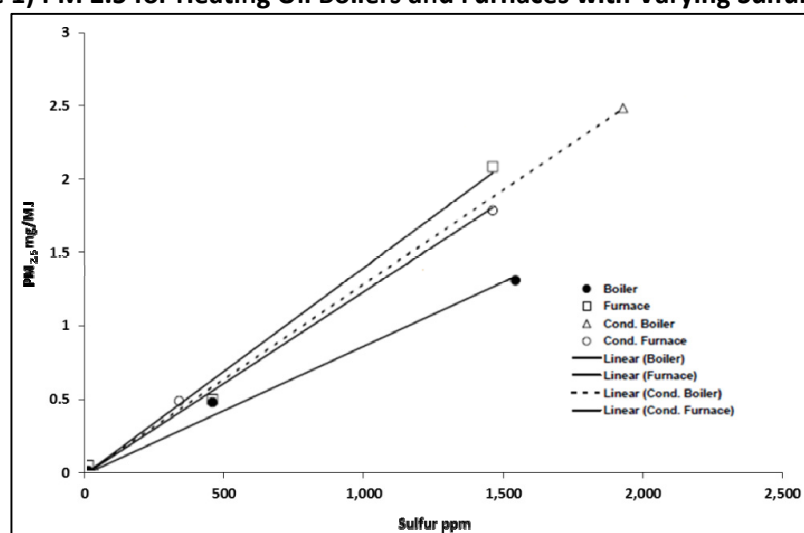
One of the biggest transitions in heating oil has been the move to ultra-low sulfur heating oil (ULSHO). This fuel lowers maintenance, improves efficiency and reduces pollution from heating systems. However, it is also paving the way for the next generation of equipment, which may mean lower cost materials and more compact boilers and furnaces.

As we know, sulfur is an abundant element and is a ubiquitous presence in our natural world as well as being an essential component of all living cells. However, in the industrial setting, the release of sulfur through the combustion of coal, petroleum, gasoline, and diesel fuel has been a challenge for air quality purposes. Historically, this was largely resolved as federal regulations removed most of the sulfur content from these fuels over many years with the final reductions coming with the ultra-low sulfur transportation diesel requirement in 2006.

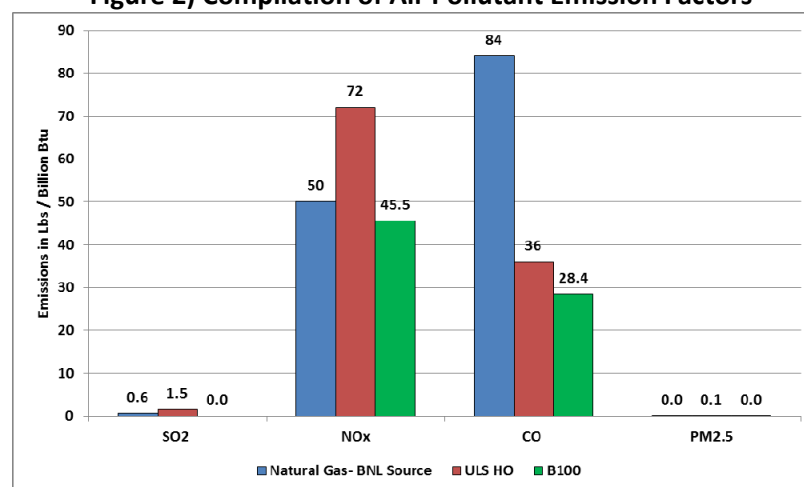
In the home fuel oil heating context, sulfur dioxide in a heating system's flue products contributes to secondary fine particulate formation in the upper atmosphere by means of photochemistry driven by sunlight. The fine particulate (PM<sub>2.5</sub>) results for the liquid fuel fired heating systems demonstrates the very strong linear relationship between the fine particulate emissions and the sulfur content of the liquid fuels being studied. This is illustrated by the plot contained in

**Figure 1** which clearly illustrates the linear relationship between the measured mass of fine particulates per unit of energy, expressed as milligrams per Mega-Joule (mg/MJ) versus the different sulfur contents of four different liquid heating fuels. The fuels included a typical ASTM No. 2 fuel oil with sulfur below 0.5 percent (1,520 average ppm sulfur), an ASTM No. 2 fuel oil with very high sulfur content (5,780 ppm sulfur), low sulfur heating oil (322 ppm sulfur) and an ULSHO fuel (11 ppm sulfur). These results show that as sulfur decreases the PM<sub>2.5</sub> emissions are reduced in a linear manner. For fuel tested with a sulfur content range in ULSHO (15 ppm sulfur) the amount of PM<sub>2.5</sub> was reduced dramatically to an average of 0.043 mg/MJ.

**Figure 1) PM 2.5 for Heating Oil Boilers and Furnaces with Varying Sulfur Content<sup>1</sup>**



**Figure 2) Compilation of Air Pollutant Emission Factors<sup>2</sup>**



**Figure 2** provides the latest comparison available from Brookhaven National Laboratory (BNL). Figure 2 ULSHO contains a maximum of 15 ppm sulfur, is generally deemed equivalent in CO, NO<sub>x</sub>, SO<sub>2</sub> and PM<sub>2.5</sub> emissions to natural gas. Also, B100 (100% biodiesel) is cleaner than ULSHO as there is no elemental sulfur in the product.

<sup>1</sup> "Evaluation of Gas, Oil and Wood Pellet Fueled Residential Heating System Emissions Characteristics", Brookhaven National Laboratory, December 2009, BNL-91286-2009-IR

<sup>2</sup> Basis for this graph: EPA AP 42-Compilation of Air Pollutant Emission Factors - <http://www.epa.gov/ttn/chief/ap42/index.html> Tables 1.3.1, 1.4.1 and 1.4.2 for small boilers (note EPA does not report on residential boilers, however consultation with Brookhaven National Laboratory confirmed the small boiler numbers are representative). Small particles (PM<sub>2.5</sub>) and SO<sub>2</sub> (1,500 ppm) values are from BNL report End Note j.

## Sulfur Regulations

The heating oil industry has been working with stakeholders, including regulators and downstream fuel providers to transition the industry to ULSHO as rapidly as technically and economically feasible.

Connecticut, Delaware, Maine, Maryland, Massachusetts, New Jersey, New York, Pennsylvania, Rhode Island and Vermont all have phase-in periods that require a dramatic reduction in the amount of sulfur present in heating oil. (

### Table 1)

Other than Maryland and Pennsylvania, both of which have mandated a reduction to 500 PPM sulfur, each of the above states will require no more than 15 PPM. Each state has set its own time table for the transition; the latest date is July 2018.

The cities of New York and Philadelphia have set their own standards with more aggressive transitions. The District of Columbia, not yet having low-sulfur requirement, has proposed 15 PPM sulfur by July 1, 2018.

Field results from New York State have already demonstrated significant improvement in systems operations and emissions.

Additionally, some of the states and New York City have either instituted a biodiesel blend requirement or have proposals in place. The inclusion of biodiesel (a renewable fuel made from agricultural products) in blends over 2% biodiesel, makes up what is known as **Bioheat®**.

## Description of Greenhouse Gas (GHG) Reductions

The subject of GHG emissions remains in flux as more data evaluations are made. In fact, as of this writing, the IPCC has published a fifth draft report. The United Nations Intergovernmental Panel on Climate Change (IPCC) report, increased the GHG multiplier for methane from 25 (100 Year Atmospheric lifetime) and 72 (20 Year Atmospheric lifetime) times CO<sub>2</sub> to 28 and 84 respectively. This amounts to a 12% (100 year) and 17% (20 year) increase in GHG impact.

A recent Harvard University study concluded that regional methane emissions due to fossil fuel extraction and processing could be  $4.9 \pm 2.6$  times larger than in EDGAR, the most comprehensive global methane inventory. These results cast doubt on the U.S. EPA's recent decision to downscale its estimate of national natural gas emissions by 25–30%.

Table 1) State 15 ppm

State	Compliance Date
Connecticut	7/1/2018
Delaware	7/1/2016
Maine	7/1/2018
Massachusetts	7/1/2018
New Jersey	7/1/2016
New York	7/1/2012
Rhode Island	7/1/2018
Vermont	7/1/2018

:

Understanding the CO<sub>2e</sub> emission role of renewable fuels presents a difficult challenge as there are a very large amount of variables which impact the calculation. There has been significant assessment of CO<sub>2e</sub> net impact analysis for soybean derived biodiesel. The most comprehensive work was done for the Renewable Fuel Standard Program (RFS2) Regulatory Impact Analysis published by EPA in February 2010<sup>3</sup>. The approach utilizes consequential approach to life cycle assessment. The model not only assesses CO<sub>2e</sub> emissions (direct and indirect), it evaluates that soybeans (about 20% oil and 80% meal) are grown for food (meal) and fuel (oil), and further an increase or decrease in price for either component has a significant ripple effect on the complex interactions with petroleum refining and the complete agricultural industry. The National Biodiesel Board analyzed the US EPA data from the RFS2 and developed the following data for use in this report:

**Table 2) US EPA Soybean Biodiesel CO<sub>2e</sub> Emissions Net Impact Based on EPA RFS2**

Biodiesel	metric tons			B gal	MMBtu	AR4-100	AR4-20
	CH <sub>4</sub>	N <sub>2</sub> O	CO <sub>2</sub>			lb/MMBtu	
Other (fuel and feedstock transport)	237	6	213,562	0.5	63,720,000	8	8
Domestic Farm Inputs and Fert N <sub>2</sub> O	-3,748	2,266	-617,142	0.5	63,656,917	-1	-8
Domestic Land Use Change	0	0	-566,317	0.5	63,656,917	-20	-20
Domestic Livestock	-6,367	0	0	0.5	63,656,917	-6	-16
Domestic Rice Methane	-24,099	0	0	0.5	63,656,917	-21	-60
International Farm Input GHG	138	437	205,926	0.5	63,720,000	12	12
International Livestock	-14,597	-334	0	0.5	63,720,000	-16	-40
International Rice Methane	6,614	0	0	0.5	63,720,000	6	16
Fuel Production - Soybean oil feedstock	2,827	17	773,538	0.5	63,720,000	29	34
Total GHG Impact without Indirect Land Use						-9	-73
Total GHG Impact with Indirect Land Use						86	22

Based on the residential boiler analysis report by ICF International, (ICF)<sup>4</sup> CO<sub>2e</sub> data and the above biodiesel results,

<sup>3</sup> EPA-420-R-10-006

<sup>4</sup> Final Report: "Resource Analysis of Energy Use and Greenhouse Gas Emissions from Residential Boilers for Space Heating and Hot Water", Revised February 2009, ICF International, Submitted to: Consortium of State Oilheat Associations Greenhouse Gas Project

**Table 3 and 4** contain the GHG emissions results for bioblends equivalent to natural gas.

**Table 3) Results for Bioblend with Equivalent CO<sub>2e</sub> Emission to Natural Gas 100 Year Atmospheric Lifetime (IPCC AR4) Annual Emissions Advanced non-condensing Boiler**

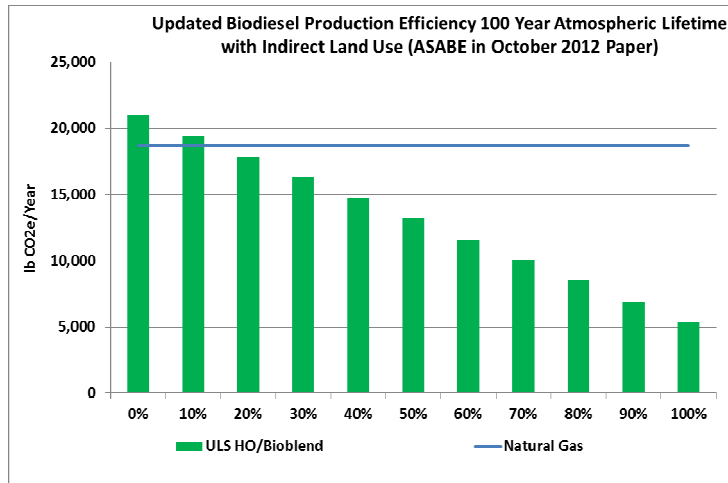
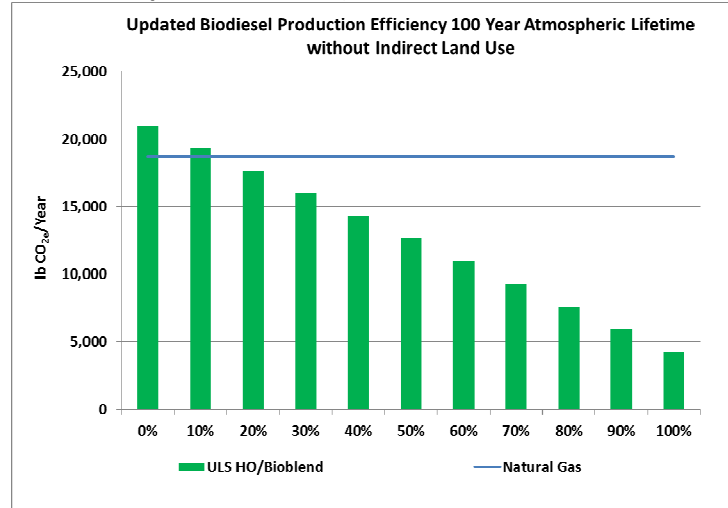
<u>without</u> Indirect Land Use (using ASABE in October 2012 paper data)			
2020			
	lb CO <sub>2e</sub> /MMBtu	lb CO <sub>2e</sub> /Year	Bioblend equal emissions to natural gas
Natural Gas	152.73 <sup>1</sup>	18,694 <sup>1</sup>	
ULS	192.93 <sup>1</sup>	20,980 <sup>1</sup>	
B100	39.30 <sup>2</sup>	4,274 <sup>1,2</sup>	
ULS HO/Bioblend	171.91	18,694	<b>13.7%</b>
<u>with</u> Indirect Land Use (using ASABE October 2012 Paper Data)			
2020			
	lb CO <sub>2e</sub> /MMBtu	lb CO <sub>2e</sub> /Year	Bioblend equal emissions to natural gas
Natural Gas	152.73 <sup>1</sup>	18,694 <sup>1</sup>	
ULS	192.93 <sup>1</sup>	20,980 <sup>1</sup>	
B100	49.36 <sup>2</sup>	5,367 <sup>2</sup>	
Blend		18,694	<b>14.6%</b>

<sup>1</sup> "Final Report Resource Analysis of Energy Use and Greenhouse Gas Emissions from Residential Boilers for Space Heating and Hot Water", Consortium of State Oilheat Associations Greenhouse Gas Project, ICF International, February 2009

<sup>2</sup> "Reassessment of Life Cycle Greenhouse Gas Emissions for Soybean Biodiesel", A. Pradhan, et al, American Society of Agricultural and Biological Engineers (ASABE) Transactions, 2012 ISSN 2151-0032 data and National Biodiesel Board Latest Calculations April 2015.



**Figure 3) Bioblend GHG Emissions by Blend Percent versus Natural Gas  
100 Year Atmospheric Lifetime (with and without indirect land use)**



### Science of GHGs (20 vs. 100)

The IPCC developed the concept of global warming potential (GWP) as an index to help policymakers evaluate the impacts of greenhouse gases with different atmospheric lifetimes and infrared absorption properties, relative to the chosen baseline of carbon dioxide (CO<sub>2</sub>). Scientific advancements have led to corrections in GWP values over the past decade, and it is imperative that our policy decisions reflect this new knowledge. In the mid-90s, policymakers for the Kyoto Protocol chose a 100-year time frame for comparing greenhouse gas impacts using GWPs. The choice of time horizon determines how policymakers weigh the short- and long-term costs and benefits of different strategies for tackling climate change. According to the IPCC, the decision to evaluate global warming impacts over a specific time frame is strictly a policy decision—it is not a matter of science:

*“the selection of a time horizon of a radiative forcing index is largely a ‘user’ choice (i.e. a policy decision)” [and] “if the policy emphasis is to help guard against the possible occurrence of potentially abrupt, non-linear climate responses in the relatively near future, then a choice of a 20-year time horizon would yield an index that is relevant to making such decisions regarding appropriate greenhouse gas abatement strategies.”*

Short-lived pollutants that scientists are targeting today, which actually warm the atmosphere, are methane and hydrofluorocarbons which are greenhouse gases like CO<sub>2</sub>; trapping radiation after it is reflected from the ground. Black carbon and tropospheric ozone, an element of smog, are not greenhouse gases, but they warm the air by directly absorbing solar radiation. Black carbon remains in the atmosphere for only two weeks and methane for no more than 15 years.

### Impact of Biodiesel on Oilheat Emissions

**Figure 3** shows that less than 20% biodiesel blend with Ultra Low Sulfur Heating Oil (ULSHO) is equivalent to natural gas with respect to CO<sub>2e</sub><sup>5</sup> emissions using a 100 year atmospheric lifetime even accounting for the impact of indirect land use according the latest EPA data from RFS2.

Focusing on near term targets for GHG impacts is both an effective strategy and recommended policy, as it can have a more dramatic effect in the short term than reductions in carbon dioxide, thus providing more time to develop appropriate carbon dioxide reduction strategies. This means shifting from the conventional 100-year atmospheric life-time to atmospheric lifetime assessment methodology to a more focused 20-year atmospheric lifetime assessment. Using the IPCC Fourth Technical Report’s 20-year shows that a less than 2% biodiesel blend with ULSHO is equivalent to natural gas with respect to CO<sub>2e</sub> emissions<sup>6</sup>. **(Table 4)**

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<sup>5</sup> Carbon dioxide equivalency is a quantity that describes, for a given mixture and amount of greenhouse gas, the amount of CO<sub>2</sub> that would have the same global warming potential (GWP), when measured over a specified timescale (e.g. 20 or 100 years). Carbon dioxide equivalency thus reflects the time-integrated radiative forcing of a quantity of emissions or rate of greenhouse gas emission—a flow into the atmosphere—rather than the instantaneous value of the radiative forcing of the stock (concentration) of greenhouse gases in the atmosphere described by CO<sub>2e</sub>

<sup>6</sup> Using EPA’s indirect analysis to 20yr GWP, the credits from methane reduction seem to overpower the CO<sub>2</sub> penalties for land use change and biodiesel’s net emissions become negative (which is very good). To be conservative, given this very positive result as well as questions surrounding indirect land, this calculation has not been factored into the benefit analysis.

**Table 4) Results for Bioblend with Equivalent CO<sub>2e</sub> 20 Year Atmospheric Lifetime (IPCC AR4) Annual Emissions Advanced Non-condensing Boiler without Indirect Land Use**

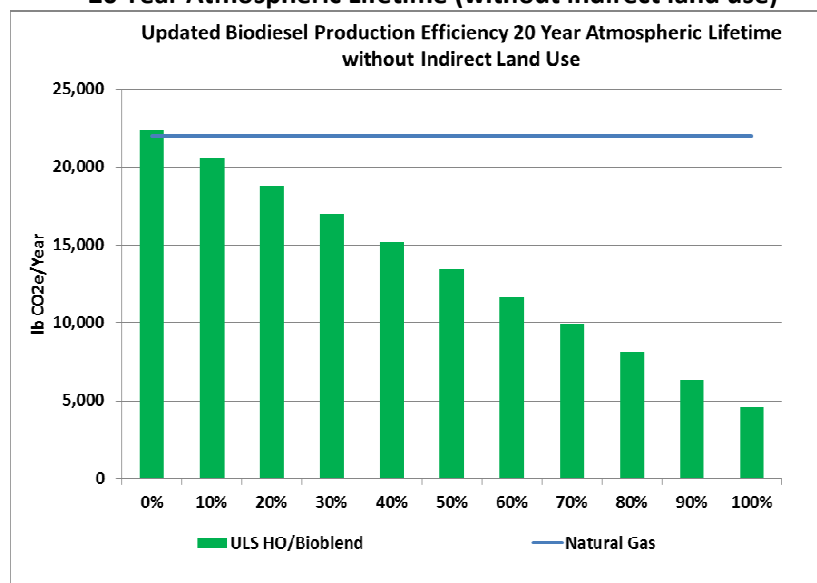
Updated Biodiesel Production Efficiency 20 Year Atmospheric Lifetime without Indirect Land Use			
2020			
	lb CO <sub>2e</sub> /MMBtu	lb CO <sub>2e</sub> /Year	Bioblend equal emissions to natural gas
Natural Gas	179.87 <sup>1</sup>	22,016 <sup>1</sup>	
ULS	205.31 <sup>1</sup>	22,326 <sup>1</sup>	
B100	<b>42.10<sup>2</sup></b>	4,578 <sup>1,2</sup>	
ULS HO/Bioblend	202.46	22016	<b>1.7%</b>

<sup>1</sup> "Final Report Resource Analysis of Energy Use and Greenhouse Gas Emissions from Residential Boilers for Space Heating and Hot Water", Consortium of State Oilheat Associations Greenhouse Gas Project, ICF International, February 2009

<sup>2</sup> "Reassessment of Life Cycle Greenhouse Gas Emissions for Soybean Biodiesel", A. Pradhan, et al, American Society of Agricultural and Biological Engineers (ASABE) Transactions, 2012 ISSN 2151-0032 data and National Biodiesel Board Latest Calculations April 2015.

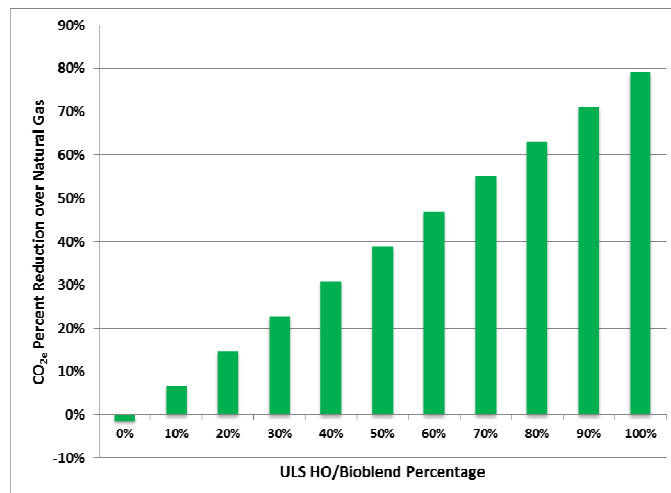
**Figure 4** provides view of the future of biodiesel as technology permits greater fraction of biodiesel, the CO<sub>2e</sub> comparison between this liquid fuel and natural gas dramatically favors biodiesel.

**Figure 4) Bioblend GHG Emissions by Blend Percent versus Natural Gas 20 Year Atmospheric Lifetime (without indirect land use)<sup>7</sup>**



<sup>7</sup> EPA's indirect analysis to 20yr GWP, the credits from methane reduction seem to overpower the CO<sub>2</sub> penalties for land use change and biodiesel's net emissions become negative (which is good). Given this very positive result, as well as questions surrounding indirect land, this calculation has not been factored into the benefit analysis.

**Figure 5) ULS HO/Bioblend CO<sub>2e</sub> Reduction versus Natural Gas  
20 Year Atmospheric Lifetime without Indirect Land Use<sup>6</sup>**



**Figure 5** shows that, as technology advances, biodiesel blends with heating oil, CO<sub>2e</sub> reduction can far exceed conventional natural gas and shale gas. Given that biodiesel blends with heating oil GHG emissions can easily be lower than natural gas GHG emissions, there is no climate change reason for fuel switching from oil to natural gas.

### Comparative View of Natural Gas

Focusing on near term targets for GHG impacts is both an effective strategy and recommended policy as it can have a more dramatic effect in the short term than reductions in carbon dioxide, thus providing more time to develop appropriate carbon dioxide reduction strategies. This renewed focus on 20-year GHG targets stimulated a reassessment of the ICF life-cycle study using the AR4 20-year numbers for methane emissions in the production, transportation, delivery and combustion of heating oil, ultra-low sulfur diesel, bio-blends, natural gas and shale gas.

Both wellhead production and local distribution company delivery system leakage have been the subjects of numerous studies and reports. It should be noted that the calculations within this report were based on the conservative ICF approach using EPA data. But, there is significant research underway which could increase the impact of CO<sub>2e</sub> of natural gas.

A report prepared for United States Senator Edward J. Markey, issued August 1, 2013 titled, “Natural Gas Pipeline Leaks Cost Consumers Billions”, highlighted the fact that “Federal and state regulators explained in interviews for this report that there isn’t a consistent methodology for calculating lost and unaccounted for gas, and data quality problems are common.” This may clearly lead to inaccurate leakage reporting to EPA.

The issue of natural gas extraction and processing emissions remains a hot topic. Balancing the latest reports, one can only conclude the University of Texas (UT) narrow focused study did not provide compelling evidence on existing fugitive emissions, while the Harvard study continues to raise compelling questions regarding methane emission levels from processing and production.

The UT and the Environmental Defense Fund study released September 16, 2013 directly measured methane emissions at 190 onshore natural gas production sites throughout the United States, including 27 wells being prepared for continuous production and 489 wells that underwent hydraulic fracturing. The authors found that the emissions measured at wells during completion varied over a large range but were, on average; nearly 50 times lower than previously estimated by the Environmental Protection Agency (EPA). By contrast, measurements of methane emissions from equipment on wells in routine production were comparable to, or higher than, EPA estimates. The authors used the measurements of methane emissions to estimate that the nation's total annual methane emissions from well completions, pneumatic devices, chemical pumps, and equipment leaks are between 757 and 1,157 gigagrams (Gg), comparable to the EPA estimate of approximately 1,200 Gg.

In addition, the UT study contains a major internal contradiction. The well sites in the study were selected with substantial input from the oil and gas industry, which volunteered specific sites. The vast majority of the wells studied used leak-control technology that has yet to be adopted at many, if not most, oil and gas wells, while others were wells that produced very little gas and consequently even serious leaks would produce relatively small emissions. Specifically, the authors noted, those wells had the potential to emit only 0.55% as much as an average well. Although the study's authors acknowledged that their measurements were by no means representative of the average gas well nationwide, they nonetheless chose to use that skewed data to estimate gas leaks nationwide. The methodology that UT chose for making that estimate has drawn criticism in the research community.

Alternatively, and according to a study released November 25, 2013 by Harvard University, methane from fossil fuel extraction and refining activities in the South Central United States are nearly five times higher than previous estimates. The new study takes a top-down approach, measuring what is actually present in the atmosphere and then using meteorological data and statistical analysis to trace it back to regional sources. NOAA and the U.S. Department of Energy collect observations of methane and other gases from the tops of telecommunications towers, typically about as tall as the Empire State Building, and during research flights. The team combined this data with meteorological models of the temperatures, winds, and movement of air masses from the same time period, and then used a statistical method known as geostatistical inverse modeling to determine the methane's origin. The team also compared these results with regional economic and demographic data, as well as other information that provided clues to the sources — for example, data on human populations, livestock populations, electricity production from power plants, oil and natural gas production, production from oil refineries, rice production, and coal production. In addition, they drew correlations between methane levels and other gases that were observed at the time.

For example, a high correlation between levels of methane and propane in the south-central region suggests a significant role for fossil fuels there.

### Environmental Conclusion

Biodiesel blends at 20% (B-20) with ultra-low sulfur heating oil (ULSHO) are lower in Greenhouse Gas Emissions (GHG) than natural gas when evaluated over 100 years, while blends of 2% (B-2) or more are lower in GHG than natural gas when evaluated over twenty years. Any ULSHO and biodiesel blend is equally clean in criteria pollutants and particulates. With future research and applications, increasing the biodiesel blend reduces GHG emissions even further. Bioblends for heating oil are a clean responsible alternative to natural gas heating systems and perform admirably against all other heating systems.

### III. ECONOMIC BENEFITS OF BIODIESEL

#### Implementation with Little or No Cost to the Consumer

As indicated in the previous section, there are a number of environmental benefits to the use of biodiesel in heating oil. As a result, the heating oil industry has been exploring the use of this fuel in its product. Doing so would allow it to respond to the environmental and energy concerns associated with conventional heating oil. Additionally, it would provide a pathway to respond to policies being proposed and implemented by various state agencies to significantly reduce greenhouse gas emissions.

The Alliance, in cooperation with the NBB and others in the industry, have worked to establish a pathway for the use of the biodiesel in heating fuel oil products. This has primarily involved ascertaining the suitability of the use of the fuel in existing heating appliances, and assessing regulatory barriers that could impede its use.

The Alliance's research determined that a blend of 5 percent of biodiesel in heating oil would not impact the operability of heating oil appliances. The research to support this was conducted at Brookhaven National Laboratory and Underwriters Laboratory. Based on this research, ASTM incorporated blends up to 5% biodiesel meeting its D6751 specification as a fungible component in traditional No. 1 or No. 2 heating oils. Blends containing up to B5 are now considered just conventional No. 1 or No. 2 heating oil and, similar to the other components that make up fuel oil, no additional labeling or specific disclosure of the exact biodiesel component content is needed.

Subsequently the Alliance began research on various blend of heating oil and biodiesel, investigating whether different levels of sulfur in the fuel combined with different levels of biodiesel up to 20 percent would impact the operability of the system. The primary focus of the research was on the seal materials present in the fuel pumps. The Alliance conducted an extensive study of these materials in both a lab and in operating conditions, and found no issues associated with biodiesel blending.

ASTM was presented with this data and in December 2014 the standards governing heating oil, ASTM 396, were amended to include a new B6-B20 biodiesel blend grade as part of the D396 heating oil standard.

The research has focused on combustion properties of biodiesel and material compatibility with existing elastomers and fuel system components. To date the research has found blends up to B20 are compatible with existing elastomers and materials and these blends perform as well if not better than conventional fuel oil. Thus, it appears that a variety of blends of biodiesel may be usable in heating oil equipment without system modifications. As the Alliance reviews higher blends of biodiesel in the future, it is anticipated that existing equipment will be able to use significant blends of biodiesel with either no modification or minor modifications that could be accomplished during annual maintenance and tune up normally performed on most home heating oil systems. Further, the Alliance is working to ensure equipment manufactured is designed for and can use higher blends without modification. As that equipment enters the field, it is likely that most consumers of heating oil will incur only minor additional costs for retrofitting their appliance prior to using biodiesel. This

provides the oilheating industry a unique opportunity to transition their customers to a renewable fuel with minimal costs to the industry and its consumers.

With regards to pricing, the Alliance has limited information on the pricing of biodiesel I versus conventional heating oil. However, the Alliance does receive periodic pricing reports from a supplier in Pennsylvania. In the last year, the price differential between heating oil and biodiesel has generally ranged between 5 and 13 cents per gallon for a B-20 gallon, although in many instances RFS2 credits or other state incentives allows biodiesel to be priced similar to or lower.

Information received from NYSERDA and a price tracking survey in New York indicate that pricing for biodiesel in New York Harbor is generally less expensive than the ultra-low sulfur heating oil used in New York. Additionally, New York State Energy Research and Development Authority price tracking indicate that retail prices in New York City with a mandated 2 percent biodiesel blending requirement are generally lower than on Long Island, even though the costs of operations in these two markets are similar.<sup>8</sup>

### Economic Impacts of Biodiesel Production & Sales

Economic benefits from producing and using biodiesel in the Bioheat® market will be provided by the economic activity associated with jobs supported by the industry. These jobs are associated with the production of biodiesel as well as the fats and oils required as feedstock, and transporting both feedstock and finished diesel fuel. The impact across the value chain for U.S.-produced biodiesel was established via three different metrics:

- **Economic impact** — quantifying the value added to the US economy across the biodiesel value chain.
- **Employment impact** — estimating the number of full-time equivalent (FTE) jobs contributed by biodiesel production, processing and distribution.
- **Wage impact** — evaluating the total wages for individuals employed along the biodiesel value chain.

The economic indicators for each step of the biodiesel value chain are evaluated at three different levels, Direct, Indirect and Induced:

- **As the name suggests, the Direct economic** effect is composed of the economic, employment and wage impacts that can be directly attributed to the biodiesel value chain. These results were calculated first hand by LMC International based on models driven by publicly and privately available data, industry knowledge, and interviews with industry stakeholders.
- **Indirect economic effects are the economic**, employment and wage impacts created by those industries that supply the biodiesel value chain, or by individuals who work at the periphery of the sector.
- **Induced economic effects are those economic**, employment and wage impacts that stem from household spending of the income earned from the biodiesel sector.

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<sup>8</sup> This information was received subsequent to initial publication, and has been added for later publications.



Direct economic impacts of biodiesel production are manually evaluated across 11 steps in the value chain — spanning from the production of feedstocks produced specifically for biodiesel production to delivery of biodiesel to the point of sale. The model also allocates impacts across all 50 states, based primarily on these states’ share of 1) feedstock production and 2) processing capacity for biodiesel. An understanding of state-level production and demand is particularly important when it comes to determining impacts on transportation.

<b>Value Chain Component</b>	<b>Description</b>
<b>Seed Production</b>	Value of the oil produced for biodiesel feedstock in seed. Given that meal is outside the scope of the biodiesel chain its value is excluded
<b>Animal Processing</b>	Processing and rendering of animal carcasses into feedstocks for biodiesel use
<b>Seed Delivery</b>	Delivery of seeds used in biodiesel to elevation facility
<b>Elevation</b>	Elevation and storage of seeds used in biodiesel production
<b>Oilseed crush (oil share)</b>	Value in removing oil from seed in crush process for use as a biodiesel feedstock
<b>Biodiesel Processing</b>	Collection and processing of feedstocks into biodiesel
<b>Rail deliveries of biodiesel and glycerin for domestic market</b>	Rail shipments of biodiesel and glycerin from surplus to deficit states with most traffic originating in the Midwest
<b>Rail deliveries of biodiesel for export market</b>	Rail shipment of biodiesel to point of export from the US
<b>Barge deliveries</b>	Barge deliveries (primarily from Midwest to Houston) and primarily for the export market
<b>Port activities</b>	Loading ocean-going vessels with biodiesel for shipments to the export market
<b>Trucking to point of sale</b>	Trucking of biodiesel (mostly blended with conventional diesel) from terminal to dealer outlet

## The Biodiesel Value Chain

### Indirect Impacts of Increased Biodiesel Production & Sales

In addition to direct employment benefits, biodiesel use also has several indirect/ancillary benefits. Specifically, increased production of biodiesel increases the global fuel supply, generates indirect and induced employment impacts, and energy security and health benefits accrue to U.S. citizens.

### Indirect & Induced Economic Impacts

The direct effects previously cited of increased biodiesel production on the U.S. economy are significant, but they fail to capture the full impact of the sector.

- There is a ripple effect that the biofuel has on supporting industries. This is known as the indirect effect. For some steps in the biodiesel value chain, the indirect effect can be quite large. This is especially true for capital-intensive aspects of the sector, like crushing of oilseeds and refining crude oil to a usable fuel. To illustrate this point, consider the typical biodiesel facility in the U.S., with an average capacity of 40-60 million gallons annually, which directly employs between 40 and 50 people (although there is considerable variation across the capacity and staffing rates of the country's 100+ operational facilities). This does not include the many jobs associated with keeping that facility operational, from white collar jobs in engineering to trade professions like electricians, plumbers and pipefitters that are done on a contractual basis making the true impact of that facility much higher.
- Similarly, direct effects fail to capture the economic activity stemming from expenditures of households drawing a salary from a given sector. While these "induced" effects are typically smaller than indirect effects, they can still constitute a sizeable economic force, particularly when the sector being evaluated is large, as is the case for biodiesel.

To capture indirect and induced effects, economists use multipliers, which are developed from "input-output" tables, which in turn measure the impact on the broader economy from some kind of exogenous shock to a specific sector of the economy. Because input-output tables and economic multipliers are the convention when estimating indirect and induced effects, they are available for many economies globally. In the case of the United States, multipliers are made available by the U.S. Department of Commerce's Bureau of Economic Analysis across 406 detailed industries and, in most cases, all 50 states.

Based upon analysis by LMC International, 1.7 billion gallons of biodiesel production supports \$16.8 billion in total economic impact, more than 62,000 jobs, and \$2.6 billion in wages paid. If biodiesel is blended at 5 percent, that would be approximately 300 million gallons of Bioheat® produced per year. Thus, almost 18% of the benefits cited by LMC could be attributed to the growing Bioheat® market.

### Biodiesel processing

Biodiesel production adds value to the American economy by processing crude vegetable oils, animal fats and waste oils into a usable fuel.

The first step in determining the value added in biodiesel production is to determine the total value of biodiesel produced and that of its primary by-product glycerin. Biodiesel production figures were

obtained by the Energy Information Administration (EIA) of the U.S. Department of Energy. For glycerin, it was assumed that it was produced at a ratio of one to ten relative to biodiesel. The total value of U.S. biodiesel and glycerin production were then determined as the product of volumes and prices which were obtained for biodiesel and glycerin from the EIA and “The Jacobson” newsletter.

### **Soybean Oil**

The breakout of feedstocks used in biodiesel production was obtained from the EIA, which reports data back to 2011, and the U.S. Census Bureau, which reported data for previous years. The unit cost of these feedstocks was obtained from various sources, with the USDA being the primary source of data. The total cost of these feedstocks to the biodiesel industry was then determined by multiplying volumes by price. The value added in biodiesel production (Direct economic impact) was then determined as the value of biodiesel and glycerin produced minus the total costs of feedstocks.

### **Seed Production, Delivery and Elevation**

Economic impacts of biodiesel production extend downstream into farming by way of the demand that biodiesel creates for vegetable oil and ultimately the seeds from which this oil is derived.

For all plant feedstocks used in biodiesel production, however, oil is just one of the products produced in processing. For soybeans and canola, meal represents a significant share of the value, while in the case of corn; inedible corn oil represents just a fraction of the total value relative to ethanol and distilled dried grains with solubles (DDGS). However, the value of the oil is important in evaluating the total return on investment in any crop decision.

Prior to being used for biodiesel, oilseeds must first be crushed to separate crude oil from protein meal. Crush margins represent the value created by purchasing seed and selling its component parts. Estimates for biodiesel’s impact on crushing employment were made by dividing the oil share of seed crushed for biodiesel by the total amount of seed crushed in the U.S. annually. It is estimated that roughly half of the plant-based biodiesel production in the U.S. is backward integrated into crushing, with the remainder of biodiesel facilities purchasing their crude oil from independent crushers. Regardless of where the oilseed crushing takes place, the employment impact is important.

### **Animal Processing**

Economic impacts from biodiesel were not assessed at the level of animal processing for a number of reasons. Inedible fats in animal carcasses have relatively little value in comparison with the more valuable parts of the animal, but what value there is, is created only by ranchers and processors rather than upstream industries. Lastly, even if one were to attempt to assign an economic benefit to the livestock sector from biodiesel, it would be quite small, given that waste fats and greases comprise such a small share of the value of the industry’s output. One can, however, make a case that biodiesel represents a share (albeit a small one) of the roughly half a million jobs in the U.S. attributed to poultry and livestock slaughter and processing. Rail deliveries of biodiesel for domestic consumption

In modeling long-range biodiesel distribution, we made a number of simplifying assumptions. First, it was assumed that all long-range deliveries of biodiesel were made by rail, when in reality, small

amounts are delivered by truck or pipeline. Additionally, that very few long-range deliveries of biodiesel take place within the region. Instead it is assumed that all long-range biodiesel shipments originate in the geographic center of the Midwest and terminate at the population centers of the five remaining PADDs.

## IV. TECHNICAL LIMITATIONS

The Alliance and Brookhaven National Laboratory have been studying biodiesel and blends into heating oil for several years. Most of the physical and chemical properties of biodiesel are fairly well known, since ASTM has had specifications for B100 as a blend stock with diesel fuel since 2001. The key properties needed for heating oil equipment and handling purposes, and some of the key attributes of biodiesel and its blends with heating oil, are discussed in more detail below

### Fuel Properties

The fuels used for heating boilers and furnaces in the residential and commercial sectors are defined in the ASTM D396 standard<sup>9</sup>. This standard defines fuels ranging from kerosene to residual oils. This standard defines a range of acceptable properties of the fuel which affect their performance in burners in the field including:

- **Flash Point** – a minimum flash point is defined and this relates to storage safety and fire prevention.
- **Water and Sediment** – these contaminants can cause problems with pumps, flow control, and burner components and a maximum is defined.
- **Distillation Temperature** – in a burner operating in steady state, sprayed fuel is vaporized before being mixed with air and burned. For any burner to operate as designed the fuel should have a vaporization / temperature characteristic within some predictable range.
- **Viscosity** – This is a measure of the flow resistance of a fuel. In a spray burner, a fuel with a high viscosity will produce larger drops, leading to the potential for poor combustion.
- **Ash** – Typically very low in heating fuels, this can affect the rate of fouling of boiler and furnace heat transfer surfaces downstream of the flame.
- **Sulfur** – This affects air pollutant emission potential as well as heat exchanger surface fouling potential. Most of the sulfur in heating oil is emitted from the exhaust vent as sulfur dioxide. A very small fraction (~ 1%) transforms to sulfuric acid aerosol. This acid can deposit on heat exchanger surfaces leading to corrosive attack and scale formation. The balance of the sulfuric acid aerosol, not deposited as aerosol, is emitted as a fine liquid particulate. These liquid aerosols emitted, while very small in amount, are the most significant source of measureable particulate emissions with the lighter oils. New York State has recently required a maximum sulfur level of 15 ppm in heating oil, a 99% reduction from earlier typical levels. Other states are also implementing sulfur reduction regulations. This is particularly important for biofuels because these must now meet the new and changing sulfur limitations.
- **Pour Point** – This is a measure of the lowest temperature at which the fuel will reasonably flow. This parameter is very important in colder climates, particularly where outdoor fuel storage may be used.

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<sup>9</sup> American Society for Testing and Materials, "Standard Specification for Fuel Oils D396-13," ASTM Inc., Coshohocken, PA, 2013.

For each of the defined properties a standard test method and limits are included. The ASTM D396 standard includes grades 1 through 6 but for some of these grades two different types are defined, leading to a total of 9 different fuels in the 2013 version of the standard. Grade 1 is the “lightest” grade with the lowest viscosity and the lowest temperature range for distillation. Grade 6 is the heaviest grade and is used only in large industrial boilers with fuel heating provision. The grade most commonly used in residential and commercial sector heating applications is No. 2 oil. In 2008 the definition of No. 2 oil in ASTM D396 was changed to allow up to 5% biodiesel content with the resulting blend being considered fully equivalent to No. 2 oil.

Biodiesel is the most widely available and widely used biofuel in the residential and commercial heating market. The properties of biodiesel as a fuel blend stock are formally defined in ASTM Standard D6751. Having a formal specification for this biofuel greatly facilitates control of the quality of this biofuel in the marketplace. Biodiesel is naturally ultra-low in sulfur content, naturally high in fuel lubricity (which may become more important as heating oil transitions to ultra low sulfur fuel oil which could have lubricity issues), contains zero aromatic compounds and 11% oxygen. The presence of oxygen and the lack of sulfur and aromatics provides a fuel that reduces emissions compared to traditional fuel oil. In addition, NBB has developed a quality management program, labeled BQ-9000 (National Biodiesel Board), which defines management practices to ensure production and delivery of fuels which meet ASTM standards.

Table 5) provides a summary of typical properties of No. 2 home heating oil, unblended biodiesel (B-100 or 100% biodiesel) and a 20% blend of biodiesel in heating oil (B-20) as well as the limits for properties as specified in ASTM D396 for No. 2 heating oil. Blends of biodiesel and No. 2 heating oil will have properties between those of the unblended fuels approximately in proportion to the blend ratio and this has been done for the B-20 properties in Table 5..

**Table 5** shows that the properties of B-100 fall out of the accepted limits for No. 2 heating oil but the properties of B-20 do not.

**Figure 6** illustrates a typical small heating system and highlights the points in the system where there could be concerns with blends of No. 2 heating oil and biodiesel or other biofuels. Fuel storage tanks could be outside, underground, or indoor. For all locations the fuels must be capable of being delivered over the whole range of outdoor temperatures which may be experienced in a specific region. Fuels which have high pour points may “freeze” into a waxy solid at very low temperatures and special handling considerations may be required.

A typical heating fuel tank would be filled four times during the heating season. For a furnace or heat only boiler, there would be no fuel turnover during the summer months and partially-filled tanks simply sit idle. Fuel tanks are not emptied prior to refills. This leads to the lifetime of a fuel in a storage tank on the order of a year. Biofuels must have sufficient stability to be stored for this time.

**Table 5) Comparison of Typical Fuel Properties, No. 2 Heating Oil and Biodiesel**

Property	No. 2 Fuel Oil	Biodiesel (B100)	B-20 Blend	ASTM Limit for No. 2 Fuel Oil
Standard	ASTM D 396	ASTM D 6751	<sup>1</sup>	ASTM D 396
Higher Heating Value (Btu/gal)	139,200	125,000	136,360	-
Kinematic viscosity (mm <sup>2</sup> /s@ 40 C)	2.7	4.0 – 6.0	3.0	4.1(max)
Specific gravity (kg/liter @ 60 C)	0.86	0.88	0.86	.876 (max)
Density (lb/gal)	7.1	7.25	7.1	7.31 (max)
Carbon (wt%)	86.6	77.0	84.7	-
Hydrogen (wt%)	13.6	12.0	13.3	-
Oxygen (wt%)	0.1	11.0	2.3	-
Sulfur (ppm)	500 <sup>2</sup>	5	400 <sup>4</sup>	500 <sup>3</sup>
Flash Point (F)	120 to 210	300	120 to 210 <sup>5</sup>	100 (min)
Cloud Point (F)	10	26 to 54	15	-
Pour Point (F)	5	5 to 50	8.6 <sup>6</sup>	21.1 (max)

**Notes –**

<sup>1</sup>At the present time a specification for a B-20 heating fuel has not been published. Recently the ASTM D-396 subcommittee voted to approve such a standard and it is expected to be published early in 2015.

<sup>2</sup>This is based on the limit of the S500 (low sulfur) category for No. 2 fuel oil. As noted in the body of the report, some states are requiring even lower sulfur fuel oil. New York requires all fuel oil to be at 15 ppm sulfur or less.

<sup>3</sup>This is based on the limit of the S500 (low sulfur) category for No. 2 fuel oil.

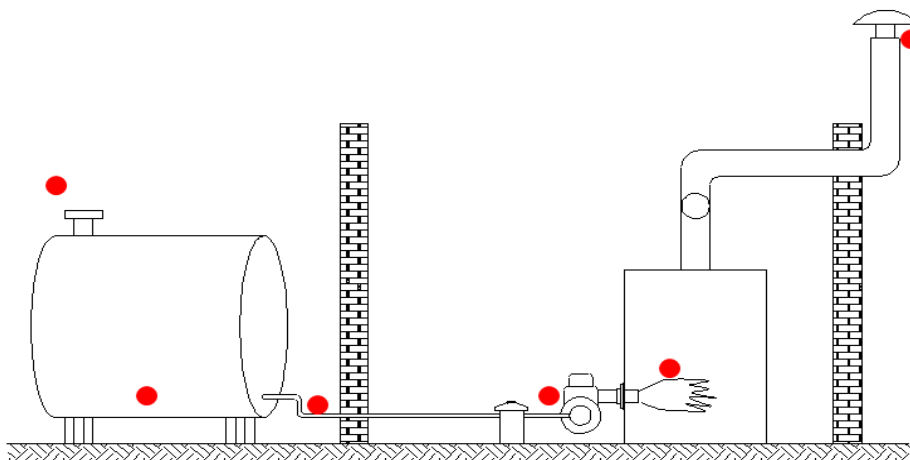
<sup>4</sup>Based on a heating oil with 500 ppm sulfur. If the heating oil meets the New York limit of 15 ppm, the B-20 blend would be well under 15 ppm.

<sup>5</sup>Based on the No. 2 oil part of the blend.

<sup>6</sup>The cloud and pour points of biodiesel depend strongly on the feedstock used. These are offered as typical values of a fuel that would be sold for winter use.



**Figure 6) Illustration of a typical oil-fired central heating system and the aspects of the system which can be affected by the use of a biofuel or biofuel blend.**



Fuel storage tanks have a service life of 20-30 years and in some cases longer. Over years of use, with No. 2 heating oil, it is very common for a layer of water and degradation products to develop. These products are typically polymeric oxidation products (“sludge” or “gum”). During a fill event it is common for the deposit layer on the bottom to be mixed into suspension for some hours. Burner system concerns such as filter and fuel spray nozzle blockage may occur as a result of this. The interface between the water layer and the fuel layer at the bottom of a tank provides an environment in which biological growth can occur. This growth can create additional polymeric deposits and an acidic environment which can accelerate corrosion of the tank bottom. Ideally, a candidate biofuel should not accelerate any potential biological growth.

The fuel piping system between the tank and the burner includes a copper fuel line (typical), shutoff valves and, commonly, a filter assembly. Elastomer materials used for sealing these components vary but nitrile rubber is common. Any candidate biofuel must not interact negatively with any of these components.

Burner components include a gear pump with integral pressure regulator, often a solenoid valve, the connecting fuel line and a spray nozzle which might be either brass or stainless steel. In the pump different types of elastomeric seals are used but nitrile rubber is common. Like all elastomeric seals, even within a general categorization such as nitrile, the exact composition and use of additives which may affect operating performance are different.

In a combustion chamber, any biofuel or biofuel blend is expected to provide rapid ignition on startup, a stable flame, a flame length and pattern similar to that for No. 2 oil and low emissions of smoke and carbon monoxide.

Oil-fired heating systems are not a significant source of emissions of oxides of nitrogen ( $\text{NO}_x$ ) and, for this reason; these burners are not subject to  $\text{NO}_x$  emission limits in the states which typically use heating oil.

## Biodiesel – Storage

Because of the structure of the biodiesel molecule, this fuel may have greater potential for oxidative degradation than No. 2 fuel oil does. This depends strongly on the base vegetable oil used to produce the biodiesel. Additives can be effectively used to enhance the stability of biodiesel.

In response to stability concerns, a stability specification has been included in the ASTM Standard for B-100 blend stock (ASTM D6751). There is no stability specification in the definition of No. 2 heating oil (ASTM D396) even though there are defined test methods and it is well known that No. 2 oil can experience degradation in the field. The stability specification included in ASTM D6751 is expected to provide at least 6 months of storage duration without concern.

The storage stability of biodiesel blends is strongly affected by the type of oil or fat used in biodiesel production. It has been clearly shown that additives can be used to extend the storage life of biodiesel<sup>10</sup>. Under ideal conditions some biodiesel blends can be stored for three years. It has also been shown that additives can be used to extend the storage stability of biodiesel blends which have partially oxidized.

While the available results are encouraging, with expanded use of biodiesel and the addition of alternative feedstocks into the market mix, continued attention on the monitoring of the degradation of fuels in long term storage situations and improved measures of the oxidation potential of biodiesel are needed.

## Biodiesel – Elastomer Compatibility

For an alternative fuel to be used safely in home heating systems compatibility with the elastomeric seal materials in use is required. Seal changes, in the case of a non-compatible fuel are technically feasible but, with some eight (8) million home oil-fired systems, the requirement of a seal change would represent a potential market acceptance barrier.

In existing heating systems, the dominant seal material is nitrile (acrylonitrile butadiene rubber or NBR; an unsaturated copolymer constructed of acrylonitrile and butadiene monomers). The presence of the acrylonitrile monomer imparts permeation resistance characteristics to a wide variety of solvents and chemicals, while the butadiene component in the polymer contributes toward the flexibility<sup>11</sup>.

Like any given polymer, the mechanical properties of nitrile butadiene rubber (NBR) vary depending on its constituents. Differences in composition may be based on the acrylonitrile content used in synthesis (commercial nitrile rubber can vary from 25% to 50%), reinforcement fillers, plasticizers, antioxidants, processing aids, and cross-linking agents<sup>12,13</sup>.

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<sup>10</sup> E. Christensen and R. L. McCormick, "Long-term storage stability of biodiesel and biodiesel blends," *Fuel Processing Technology*, vol. 128, pp. 339-348, 2014.

<sup>11</sup> Reichhold Chemicals, Inc., "What is Nitrile?," *Technicare Bulletin*.

<sup>12</sup> S. Chakraborty, S. Bandyopadhyay, R. Ameta, R. Mukhopadhyay and A. Deuri, "Application of FTIR in characterization of acrylonitrile-butadiene rubber (nitrile rubber)," *Polymer Testing*, vol. 26, pp. 38-41, 2007.

<sup>13</sup> T. Yasin, S. Ahmed, M. Ahmed and F. Yoshii, "Effect of concentration of polyfunctional monomers on physical properties of acrylonitrile-butadiene rubber under electron-beam irradiation," *Radiation Physics and Chemistry*, vol. 73, pp. 155-158, 2005.

In the process of obtaining a listing approval for a burner for application in this market testing is typically done guided by standard UL 296 which incorporates a material compatibility test for elastomeric materials, UL 157. This test involves an immersion period of  $70 \pm 1/2$  hours at  $23 \pm 2$  °C ( $73.4 \pm 3.6$  °F). Suitable elastomers are required to retain more than 60% of their unconditioned tensile strength and elongation and volume swell must fall within the range of -1 to + 25%.

In a study published in 1997<sup>14,15</sup>, Southwest Research Institute reported on their evaluation of a range of different elastomer types exposed to biodiesel / petroleum blends. Fuels included in this study included JP-8, B-100, low-sulfur diesel fuel, "reference" diesel fuel and blends at the B-20 and B-30 level. Samples were immersed at 51.7 °C (125 °F) for 0, 22, 70, and 694 hours.

In a more recent study<sup>16</sup>, Southwest Research Institute and the National Renewable Energy Laboratory (NREL) evaluated the compatibility of several elastomers including 3 different types of nitrile in B-20 blends and ethanol-diesel blends. The nitrile materials included a general purpose NBR, and high aceto-nitrile content rubber, and a peroxide-cured nitrile rubber. These materials were selected as being typical of materials used in automotive applications. Samples were immersed at 40 °C (104 °F) for 500 hours.

Tests reported in the early study by Southwest Research Institute for elastomers common to diesel engines showed some effect of the biodiesel blend on the nitrile materials. This included volume swell in the 20% range and a reduction in tensile strength as high as 38%. These tests were done at much higher temperature and for much longer times than required by UL 157, but the magnitude of property change reported was still within the acceptable range under UL 157, although marginally. The later study reported on by Southwest Research and NREL<sup>9</sup> showed no significant effect of the biodiesel blends on the NBR materials studied, leading to the conclusion "...all of these elastomers appear to be fully compatible with 20% biodiesel blends".

In another, potentially relevant, study done by UL<sup>17</sup> the compatibility of B-5 blends with elastomers typically used in oil burner applications was studied in compliance with the UL157 standard. Two specific nitrile materials were included. The study conducted by UL at the B-5 blend level also showed no significant effect of the biodiesel blend on the materials tested.

As part of a new study<sup>18</sup> to evaluate the practical upper limit of biodiesel content in a blend with home heating oil, BNL has completed compatibility tests with NBR at blend levels from 0 to B-100. In collaboration with the dominant manufacturer of pumps on legacy oil burners in the U.S., one specific NBR material commonly used in the heating oil industry was identified for evaluation. This is

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<sup>14</sup> E. Frame, G. Bessee and H. Marbach, "Biodiesel Fuel Technology for Military Application," Southwest Research Institute, 1997.

<sup>15</sup> G. B. Bessee and J. Fey, "Compatibility of elastomers and metals in biodiesel fuel blends," Society of Automotive Engineers paper 971690, 1997.

<sup>16</sup> E. Frame and R. McCormick, "Elastomer compatibility testing of renewable diesel fuels," National Renewable Energy Laboratory NREL/TP-540-38834, 2005.

<sup>17</sup> Underwriters Laboratories, "Report on the Interchangeability of B5 biodiesel within Residential Oil-Burner Appliances Intended for Use with No. 2 Fuel Oil," UL Report File MP4132, 2007.

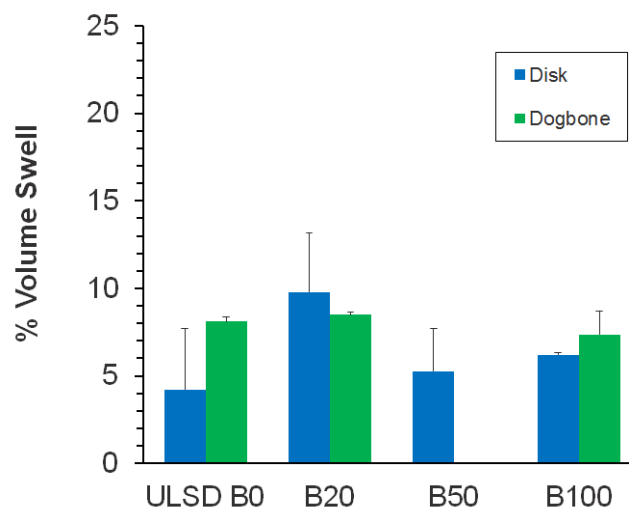
<sup>18</sup> T. Butcher, "Limit Blend for Biodiesel in Heating Oil," in Biodiesel Technical Workshop, Kansas City, 2013.

a high aceto-nitrile material used for the critical pump shaft lip seal. Slabs of this material were obtained from the manufacturer for use in these tests. Immersion was done for 670 hours at 51.7 °C (125 °F), conditions much harsher than that normally used to qualify seals per UL 157.

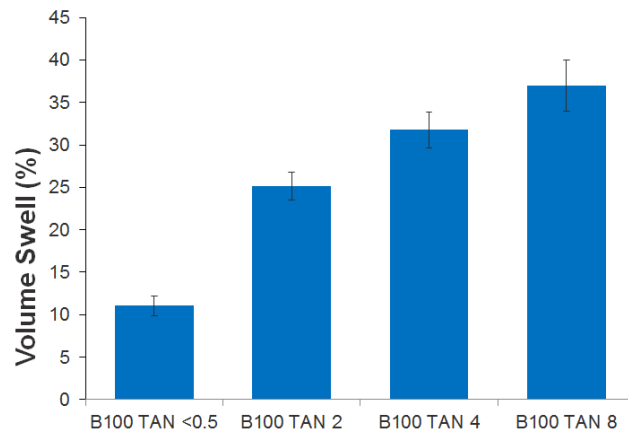
The studies at BNL showed full compatibility between the NBR material used in common oil burner seals and biodiesel blends up to B-100. **Figure 7** below, for example illustrates the effects on volume swell. Results are similar for tensile strength, hardness, and compression set over the 670 hours regardless for petrodiesel and all biodiesel blends up to B100.

In an interesting part of the BNL study the effects of elevated acid number on NBR material properties was evaluated. It was shown that acid numbers well above the specification limits does lead to significant interaction with the NBR materials. In this test acid number was increased through the addition of decanoic acid and this effect is illustrated in **Figure 8**. It is postulated that elevated acid number caused by accelerated testing degradation contributed to observed effects of biodiesel on NBR materials in the earlier reported tests, especially since many of these earlier tests were completed prior to the addition of a stability specification for B100 and other changes to the B100 specifications which were implemented to secure the ASTM approval for biodiesel blends in 2008.

**Figure 7) Results from BNL study - impact of biodiesel blend level on swell of common pump elastomer seals**



**Figure 8) Example results, tests at Brookhaven National Laboratory. Impact of acid number on NBR material volume swell in B-100.**



## Biodiesel and Pump Performance

A critical component in the fuel system of an oil-fired heating system is the burner pump. This unit performs the following functions:

1. Lifting the fuel from underground storage, clearing the fuel line air rapidly during initial operation;
2. Creating and regulating the required pressure for proper atomization, typically 100-150 psi.
3. Providing a “sharp” turn-on and turn-off of flow to the nozzle to prevent after-drip or injection of fuel under a low pressure, poor atomization condition.

The dominant manufacturer of the pumps in use in existing equipment in the field is Suntec Industries, with an estimated 90% market share for these installed units. This gear-pump includes a NBR lip-seal on the rotating input shaft. Potential leakage of this seal with biodiesel blends has been identified as a high priority area for evaluation in considering higher levels of biodiesel in heating oil.

Detailed bench level compatibility studies overviewed in Part 1 using elastomer slab samples provided by the pump manufacturer showed no impact of biodiesel blends up to B100 compared to conventional heating oil. To compliment these basic materials studies, a decision was made to undertake long term, cyclic durability tests with pumps. In the field, these burners and pumps cycle on/off 5,000 to 10,000 times annually, and it was desired to confirm the performance of the seals in actual pump operation.

The pump test was implemented at the Energy Institute of Penn State University with oversight by the industry’s Bioheat® Technical Steering Committee. The pump manufacturer was involved with the definition of the test setup and evaluation protocol. The methods were based on established methods used to evaluate candidate seal materials.

The testing was planned to involve a 5-gallon fuel supply for each pump, setup in a continuous loop with a 5 minute on/ 1 minute off controlled cycling pattern. The piping was arranged without a fuel spray nozzle but the pump developed its full operating pressure each cycle. A photo of the setup is provided in .

In the test program, a key performance measurement parameter was observed seal leakage rate. The project was started in 2010 but upon reviewing the initial results it was discovered there was some confusion regarding the leakage rates measurements. The measurements were being done differently than that being used by the manufacturer. This was corrected, and all new pumps were installed and the test restarted.



Figure 9) Photo of pump test

The testing was done with two base fuels—a conventional No. 2 heating oil at 1500 ppm sulfur content and an ultralow sulfur heating oil at 15 ppm. Three different biodiesel blend levels were studied for each fuel – 0, 12, and 20%. The biodiesel was a commercial blended-feedstock fuel provided by Hero BX. This fuel met all requirements of ASTM D-6751-11. For each fuel blend a total of 7 pumps were run in this 7,000 hour test. Quality of all fuels was monitored throughout the project to insure the fuel had not degraded significantly during the test due to the stressing of the fuel in the test. Acid number was considered the primary criterion for this. High acid numbers were not observed, and thus the test considered acceptable from that standpoint.

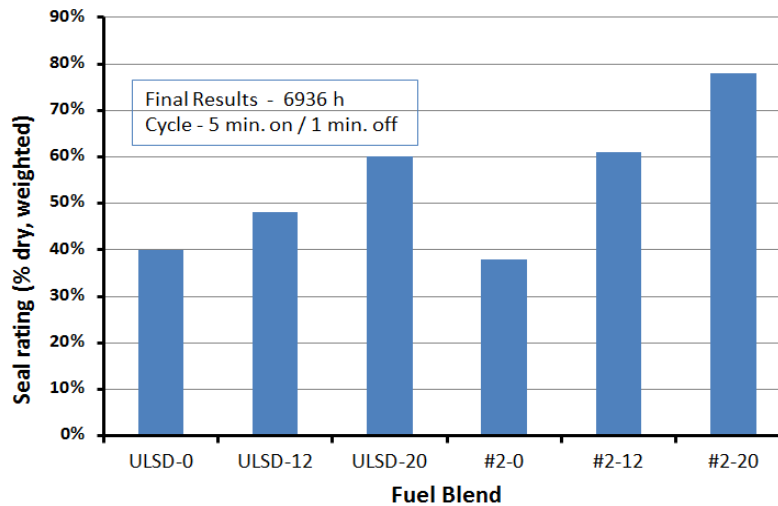
Fuel pump shaft seal observed leakage was a key performance measure and this was monitored on a regular basis. The manufacturer provided a scale from 1 to 4 based on observed leakage. These are all very low leakage rates. For example a No 2 leak is described as “wet seal with a slight accumulation in the seal cavity area”. A No 4 (highest) leak is actual fuel running down over the hub face. These leak rates likely would not be noticed in the field. A seal leak metric for the entire set of pumps was based on a weighted-percent-dry metric. The weighting penalizes a leak situation to a greater degree if it occurs early in the 7,000 hour test period.

**Error! Reference source not found.**Figure 10 provides a summary of the test results. In this figure the Seal Rating is used – a higher value indicates better performance. The most significant conclusions are:

- Seal performance improves with increasing biodiesel content
- Seal performance is equivalent at B0 for both 15 and 1500 ppm sulfur fuels
- Seal performance is better with 1500 ppm sulfur fuel than with the ULSD fuel at the same biodiesel level.

Two pumps “bound-up” in the 4600-5000 hour time frame. These were both at the B-12 blend level and both base fuels were involved. Other than this occurrence no operational problems were observed. Following these tests the pumps were all shipped to Brookhaven National Laboratory for internal inspection. No unusual conditions or fuel related issues were noted from the inspection. Thusly, while both the seizures were with B12, it is not believed they were fuel-related.

**Figure 10) Overall results of pump stand testing. These results illustrate better performance (higher seal rating) as biodiesel content in blend increases.**



### **Biodiesel – Combustion and Emissions**

Aspects of acceptable combustion performance include: reliable ignition under field conditions, flame stability, low air pollutant emissions, low potential for formation of coke on burner heads, and safe/reliable operation of the burner sensors and controls. Several important laboratory studies have been done on the combustion performance of biodiesel/heating oil blends in North America. An overview of the key findings with an emphasis on blends at the B-20 level is presented below:

**Laboratory Studies**—Initial laboratory testing of biodiesel as a fuel was done by the R.W. Beckett Corporation in 1993. Using conventional burners this involved a simple comparison of B-100 and normal heating oil of the S5000 sulfur grade with nominal sulfur level of 1500 ppm. In a later study at Beckett (Turk, 2002) a comparison was done of the NO<sub>x</sub> and SO<sub>2</sub> emissions of heating oil, B-20, and B-100.

Results of testing with a variety of space heating appliances were reported by Batey in 2003 (Batey, 2003). This study directly compared performance of a conventional heating oil with a B-20 blend of soy-based biodiesel blended into 500 ppm sulfur oil. Equipment evaluated included a commercial steam boiler, an older residential hot water boiler, a compact residential hot water boiler, an older residential warm air furnace, and two additional typical residential hot water boilers. The work focused on steady state CO, smoke number, and NO<sub>x</sub> emissions.

In another lab study, reported by Krishna et.al, in 2001 (Krishna, Celebi, Wei, Butcher, & McDonald, 2001) both startup and steady state performance of biodiesel blends and conventional heating oil were studied using a conventional residential boiler. Blend levels to B-100 were included. In the transient part of this study CO emission profiles from cold start were compared. High startup CO emissions are an indicator of poor ignition performance, and were compared and found to be independent of biodiesel content. Cold start in this case was with the boiler at 55 F, much colder than typical in normal field operation.

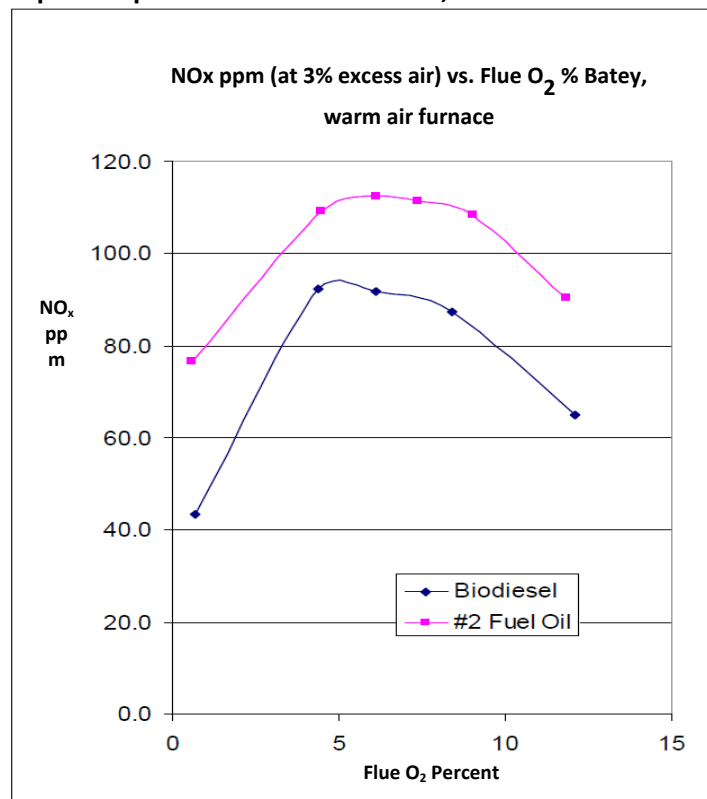


Win Lee et al (Lee, 2004) conducted a set of careful measurements in a test facility in Ottawa, Canada using a cast iron, residential hot water boiler. Tests were run on the baseline fuel oil and on a B20 blend made from a commercial soy biodiesel. These studies included particulate emissions as well as gas-phase emissions.

**Key Results**—A common result from all of the studies is that basic burner operation with biodiesel blends at B-20 (at least) is the same as with unblended heating oil. Observations are that startup behavior and flame stability are seamless. This general observation was specifically documented in the transient CO measurements made by Krishna et.al. (Krishna, Celebi, Wei, Butcher, & McDonald, 2001). Another observation is that smoke number and CO emissions in steady state are either the same or lower than with unblended heating oil. **(Figure 11)**

Most of the studies showed that NO<sub>x</sub> emissions are lower with B-20 although in some cases, at some excess air levels similar NO<sub>x</sub> levels were reported.

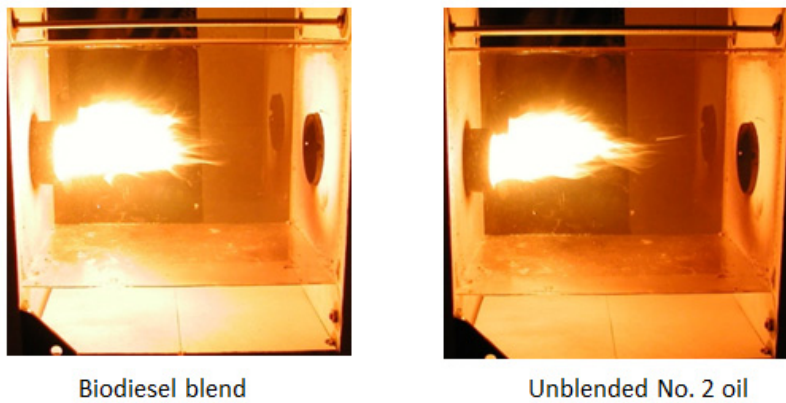
**Figure 11) Example comparison of NO<sub>x</sub> emissions, B-20 and unblended heating Oil**



Sulfur dioxide emissions are a function only of the sulfur content of the fuel. Relative to unblended heating oil, biodiesel can be considered nearly sulfur-free and so reductions in SO<sub>2</sub> were observed in proportion. Similarly, it has been shown that most of the fine particulate emissions from small oil burners are due to sulfates and these emissions are directly proportional to fuel sulfur content. Again, this leads to lower emissions with the biodiesel blends.

In tests at much higher blend levels, to B-100, it was shown that the amount of visible light produced by a biodiesel flame is lower than that of a flame from unblended heating oil. This is most likely due to the lower particulate emission and cleaner burning nature of biodiesel. The practical implication of this is that it could impact the ability of the flame sensor to detect a viable flame with higher concentrations of biodiesel and shut off the burner unnecessarily. The flame sensor is part of the flame safety control system whose function is to determine if there is a viable flame when fuel is flowing through the burner nozzle. This helps ensure unburned fuel does not accumulate in the burner chamber. If high biodiesel blends are used, the flame sensing system may need to be modified to insure the unit does not shut off due to a cleaner, non-detectable flame with high concentrations of biodiesel. There have been no reports of this as a concern at the B-20 level.

**Figure 12) Comparison of the flame from a biodiesel blend and no. 2 oil**



## V. MARKET ACCEPTANCE

### Bioheat® Trademark

In an effort to clearly establish and provide guidance to consumers and the industry as to what is an acceptable fuel, the Alliance and NBB acquired the rights to use the trademarked term Bioheat®. This term of use is restricted to blends of biodiesel of at least 2 percent. Retail oil dealers and other distributors are provided with a no cost license to use this term if they are selling the fuel. At this time over 300 parties are using the Bioheat® trademark.

### Efforts on Marketing

Over the years, the Alliance and NBB have communicated the value of using biodiesel and selling Bioheat®. The Alliance features information about Bioheat® on its consumer website, OilheatAmerica.com NBB has a webpage, Bioheatonline.com that describes the advantages of Bioheat®. Further, the Alliance and its affiliated state associations have worked to provide education on this product to consumers and retail oil companies through the use of mass media and informational brochures.

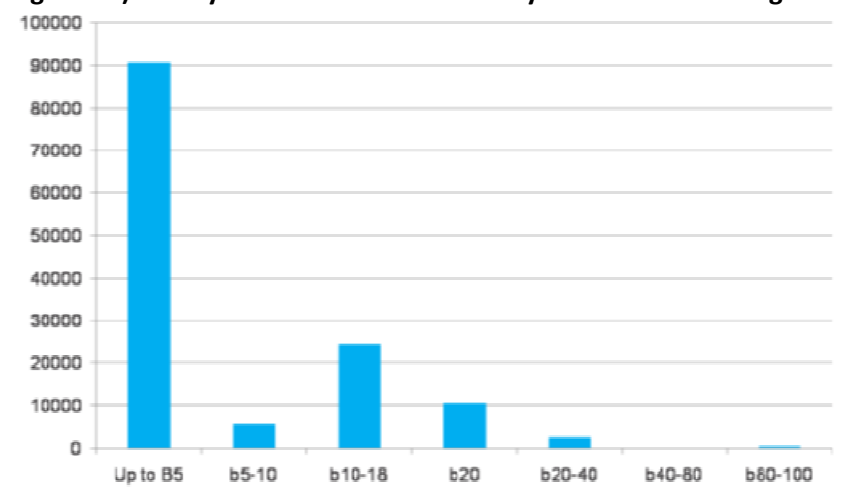
NBB has undertaken similar efforts. NBB has sponsored dealer and technician training for several years, and has participated in conferences throughout the northeast and Midwest Additionally, NBB has sponsored communication efforts on Bioheat® including designing a website focused on Bioheat®, and direct consumer outreach using mass media.

### Dealer Survey

In conjunction with BNL, the Alliance conducted a survey of retailers who were distributing Bioheat®. The survey was to better understand the different blends being used, and whether heating oil companies had identified issues with using biodiesel blends.

In evaluating the results, the Alliance was surprised by the wide distribution of different levels of fuel being used and the number of households using high blends. This information has been utilized to better understand and evaluate higher blends.

**Figure 13) Surveyed Bioheat® Customers by Bioblend Percentage**



**Table 6) Surveyed Bioheat® Customers by Bioblend Percentage**

Bioblend Percent	Customer Count	Percent of Total
Up to B5	90,711	67.9%
B5-10	5,328	4.0%
B10-18	24,521	18.3%
B20	10,330	7.7%
B20-40	2,397	1.8%
B40-80	4	0.0%
B80-100	380	0.3%

### **Marketing in the Industry**

Information about Bioheat® is widely distributed in the heating oil industry. There are three principal conferences each year, New England Fuel Institute, Atlantic Region Energy Expo, and the Oil and Energy Service Professionals. Each of these conferences highlights the role of Bioheat® in the industry each year. Additionally the trade magazines, Indoor Comfort Marketing, and Oil and Energy provide continuous information on the use of Bioheat®.

The Alliance and the NBB have also highlighted the role of individual companies in distributing the fuel. NBB provided a glossy featuring the use of biodiesel and the impact on companies. Two heating oil retail companies were prominently featured in this significant publication. <http://www.industry-publications.com/NBB/biodieselsuccessstories.pdf>. These retail companies described how important the use of biofuels was in repositioning their companies as market leaders, and demonstrated to their communities their support for renewable fuels.

## VI. STATE AND LOCAL INITIATIVES

### State Mandates or Incentives

State and local governments have utilized a number of strategies to encourage the use of biodiesel in their communities. To have an alternative fuel enter a market, it is often necessary to foster its use with incentives or requirements. This leads to the development of infrastructure and overall market acceptance.

The true leader in that effort is the City of New York. New York City currently requires that at least 2 percent of all heating oil sold in the City be biodiesel. Additionally, buildings owned by the City are to use various blends of biodiesel at a blend level of 5 percent.

The State of Rhode Island recently adopted and implemented a similar requirement. Currently all heating oil in that state must be blended with 2% biodiesel. That percentage will increase steadily until it reaches 5% by 2017.

Massachusetts was the first state to pass into law a statewide biodiesel requirement. However, it has not been implemented.. The state was concerned with the overall greenhouse gas emissions from biodiesel and the practicality of a Massachusetts program implemented separate and apart from the other states in New England. With new information on biodiesel's environmental advantages and the successful implementation of requirements in Rhode Island and New York City, it is likely that Massachusetts will reexamine its position.

Similar to Rhode Island, Connecticut and Vermont have enacted requirements for the use of Bioheat®. However, the policies are dependent on adjacent states adopting similar requirements. Thus, the Connecticut policy would only be implemented when adjacent states pass into law similar requirements.

### Tax Incentives

In addition to requirements, incentivizing the use of biodiesel with tax advantages is also common. New York State has enacted a personal tax credit for biodiesel. Under this system, a household will receive \$.01 per gallon for each percentage of biodiesel in the fuel. For a blend of 20 percent for a household using 800 gallons, this could result in receipt of a tax credit in the amount of \$160 per annum

### State Efforts to Lower GHGs

#### How Biodiesel could work

Biodiesel is now produced in the U.S. in quantities significant enough to have a clear impact on the home heating oil market. However, other alternative fuels can be considered for displacement of diesel (Smagala, Christensen, Mohler, Gjersing, & and McCormick, 2012) and heating oil and have received attention. This includes:

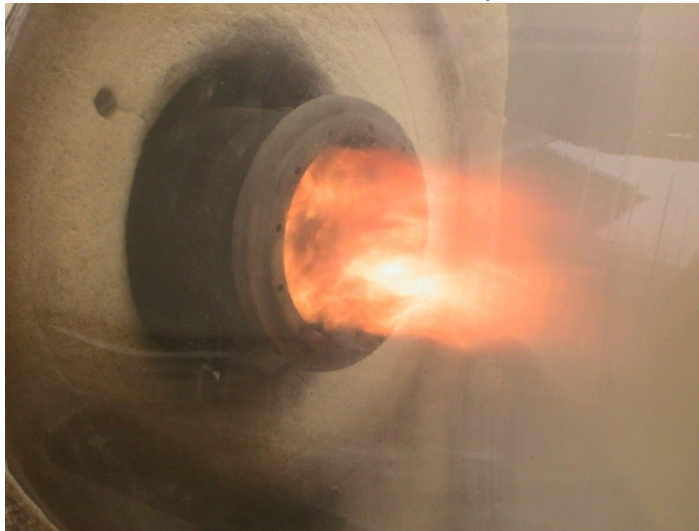
- Hydrotreated vegetable oils
- Unconverted vegetable oil (straight vegetable oil or SVO)
- Esters of levulinic acid
- Free fatty acid fuels from hydrolysis of waste greases (FFA)

- Raw pyrolysis oil
- Upgraded pyrolysis oil

All of these fuels have been evaluated for use in home heating systems to different degrees at BNL. Generally, for any alternative fuel to be considered for widespread use as a blend stock to displace petroleum fuels it needs to meet all of the requirements for storage, handling, materials compatibility, combustion and air pollutant emissions as discussed in Section V above. Experience to date has shown that fuel stability and compatibility with legacy materials is likely to be more of a concern than combustion performance. In this regard, there is a strong contrast between diesel engine applications and the stationary burners. Burners involve a simple, steady atmospheric combustion process and are relatively tolerant to fuel quality. Stationary burners for this reason can be considered a preferred market entry point for alternative fuels. While more tolerant than diesel engines to fuel quality it is still critical that any alternative fuel be able to be used in the stationary market safely and reliably.

Some of the fuels in the above list can be considered as specialty fuels which will require hardware conversion for reliable use and may not be miscible with No. 2 fuel oil at all. This might include for example special seal materials or fuel heating provisions. Raw pyrolysis oil, SVO, and FFA fuels are in this category. These fuels have potential for displacement of petroleum fuels but are practically limited to larger applications where investment cost associated with conversion are justified and, potentially, there is a unique local fuel supply opportunity.

**Figure 14) FFA fuel (processed trap grease) firing in a residential oil burner in tests at Brookhaven National Lab. Fuel temperature is 230 F.**



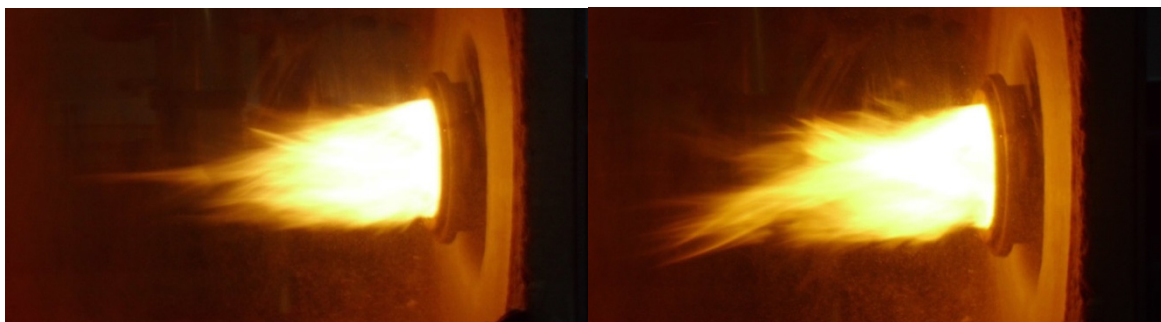
Some of the fuels in the above list are high quality but low aromatics fuels and this includes the hydrotreated vegetable oils, GTL and CTL. These fuels are considered very strong candidates, technically, for the displacement of petroleum in stationary burner applications and the primary limitation to their deployment is availability and cost. If used at high blend levels or without blending, elastomer swell and lubricity may be a concern requiring additives. Overall, however, these fuels can be considered technically ready for use in this market, assuming that the properties of ASTM D396 for No. 2 heating oil are met.

Esters of levulinic acid are under active commercial development as a blend stock at low levels for No. 2 heating oil and No. 2 heating oil/biodiesel blends. These fuels offer potential as a low cost, biomass-derived alternative fuel. However, the properties, qualities, and blend formulation are still under development. NORA is interested in this area and is considering projects focused on this fuel.

Currently BNL is working on a Department of Energy sponsored project to evaluate the use of upgraded pyrolysis oils (“bio-oil”) as a direct displacement fuel for petroleum in home heating oil (Mante, Butcher, Wei, Trojanowski, & Sanchez) (U.S. Department of Energy, Bioenergy Technologies Office, 2012). The target is a 20% blend ratio in heating oil with a product fuel that is fully compatible with the supply and end use infrastructure. Several other national labs and the Alliance are also involved in this program. Raw pyrolysis oil is acidic, unstable, and not miscible with No. 2 oil. Through catalytic hydroprocessing this fuel can be converted into a very suitable fuel. Full conversion to a synthetic hydrocarbon, however, is expensive and a key technical challenge in this program is finding an economical compromise between upgrade cost and technical quality of the product. Results to date indicate very strong potential for the use of highly upgraded bio-oil as a direct replacement fuel. Again cost and availability are key current barriers.

For partially upgraded bio-oil, fuel storage stability and elastomer compatibility are seen as the primary technical concerns. Equipment manufacturers in this industry are beginning to introduce pumps and other components which have different elastomers (viton vs nitrile) which are more compatible with biofuels. This transition may provide an opportunity for expanded use of partially upgraded fuels. The transition period however, may be long. Typically residential marketers deliver to thousands of customers and the need to deliver different fuels to different customers would be a significant market barrier for any new fuel.

**Figure 15) Comparison of the flame of No. 2 heating oil (left) and 100% upgraded bio-oil (right). Tests at Brookhaven National Laboratory**



## VII. CONCLUSION

The biodiesel fuel and the move to renewable fuels present exciting opportunities for the heating oil industry and its consumers. First, such a transition to renewable fuels will be made with minimal capital costs by consumers. Thus, a significant barrier to the use of renewables will be avoided, as the industry transitions its customers to renewable fuel with no required or minimal upfront costs by consumers. Second, it provides an exciting opportunity for the local oilheat retailers to continue to serve their customers into the future, which will allow these companies to provide employment for individuals in service, marketing, and management in local communities.

This transition to a renewable fuel also provides an opportunity to examine the relationship to competing fuels. As noted in the report, heating oil has continued to take steps to reduce its emissions profile and the recent reduction in sulfur in fuel is a significant step forward, and puts emissions of criteria pollutants on par with natural gas. Second, as the report noted, a close examination of greenhouse gases indicates in the short term, a transition to low levels of biodiesel in heating oil may be the most effective method to reduce greenhouse gas emissions, and a movement to natural gas may be far less effective.

The short term goal of the industry is to move to higher levels (more than 20%) may require some technological changes in heating equipment. To that end, the Alliance and NBB are continuing to work to develop a 100 percent biodiesel fuel that will be suitable for heating oil applications, and a burner that can be used to burn 100 percent biodiesel. The Alliance has initiated contracts with vendors to develop such equipment and is excited by the opportunity that developing this equipment in the near term will provide for the long term future of the industry and the environment.



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## APPENDIX A – CONGRESSIONAL REPORT REQUIREMENT LANGUAGE

### Subtitle D-Oilheat Efficiency, Renewable Fuel Research and Jobs Training

#### (D) REPORT. –

CONTENTS.-The report required under clause (i) shall-

- (I) PROVIDE information on the environmental benefits, economic benefits, and any technical limitations on the use of biofuels in oilheat fuel utilization equipment; and
  - (II) Describe market acceptance of the fuel, and information on State and local governments that are encouraging the use of biofuels in oilheat fuel utilization equipment.
- (ii) COPIES.- The Alliance shall submit a copy of the report required under clause (i) to-
- (I) Congress;
  - (II) The Governor of each State, other appropriate State leaders, in which the Alliance is operating; and
  - (III) The Administrator of the Environmental Protection Agency.

## ERRATA (OCTOBER 25, 2015)

The following corrections have been made to the report since publication

Page 3 - Paragraph replaced to better describe research findings Fuel validation and utilization; Research has been conducted at Pennsylvania State University, Brookhaven National Laboratory (BNL and Underwriters Laboratory (UL) on blends of biodiesel and heating oil. UL studies were limited to 5 percent blends, while the other organizations evaluated higher blends, up to B-20. The studies have not identified problems in the operation of the higher blends. However, some manufacturers of small fuel pumps have indicated that elastomers and seal materials should be replaced if a blend over 5 percent is used.

Page 23 - B-2 changed to B-20

Page 24 - 40F changed to 40C

Page 24 - “heating oil” changed to “fuel oil”



November 21, 2016

Jordan Garfinkle  
Environmental Analyst  
Massachusetts Department of Environmental Protection  
1 Winter Street  
Boston, Massachusetts 02108

**Reference: 310 CMR 7.77 Reducing Greenhouse Gas (GHG) Emissions from Electricity Generating Facilities Program**

Dear Mr. Garfinkle:

On behalf of the Energy Recovery Council, I am writing you to share our views on the new greenhouse gas from electricity generation facilities regulation. We strongly support the Department's decision to not include waste-to-energy (WTE) in the regulation.

The Energy Recovery Council is the national trade association representing companies and local governments engaged in the waste-to-energy sector. There are 77 WTE facilities in the United States, which produce clean, renewable energy through the combustion of municipal solid waste (MSW) in specially designed power plants equipped with the most modern emission control equipment.

Waste-to-energy is widely recognized as a source of GHG mitigation by the US EPA and internationally. WTE offsets GHGs in three ways: (1) it generates energy that otherwise would be produced by natural gas facilities; (2) it results in the complete disposal of solid waste otherwise destined for a landfill, where it would contribute to the emission of methane for generations; and (3) it results in the recovery of metals for recycling. In fact, the United Nations International Panel on Climate Change called WTE a "key GHG mitigation technology".

MassDEP's decision is consistent the Regional Greenhouse Gas Initiative (RGGI), the US EPA's Clean Power Plan (CPP), the European Union Emission Trading Scheme (EU-ETS), Kyoto Protocol's Clean Development Mechanism (CDM) and the Verified Carbon Standard (VCS). In fact, WTE is eligible for carbon credits under the US EPA's Clean Power Plan, Kyoto Protocol's Clean Development Mechanism and the Verified Carbon Standard.

Thank you for the work you continue to do to reduce greenhouse gas emissions from the Commonwealth and for your recognition that WTE does not belong in the 310 CMR 7.77 regulation.

Sincerely,

A handwritten signature in blue ink, appearing to read "Ted Michaels". The signature is fluid and cursive, with a large, sweeping "S" at the end.

Ted Michaels  
President

**From:** Charlotte Milan

**Sent:** Tuesday, November 15, 2016 10:31:23 PM (UTC-05:00) Eastern Time (US & Canada)

**To:** Strategies, Climate (DEP)

**Subject:** Gas leaks in our community

Dear Mass DEP,

I am writing to express my concern about the number of gas leaks that have gone unattended by the utility companies in Massachusetts.

Recently it has come to my attention that there are at least 177 Natural Gas leaks in the town of Arlington alone and approximately 20,000 statewide. There are streets in Arlington where one can actually smell the leaking gas.

The methane from the Natural Gas leaks is bad for our health, bad for the plant life around us, adds to the warming of the planet and could pose a safety hazard. Also, we, the consumers, are the ones paying for lost and unaccounted for gas.

For all these reasons, we need strict regulations to ensure that the gas companies fix all gas leaks. Identifying and fixing the largest leaks (the "super-emitters") should happen as soon as possible, but we also want all other gas leaks fixed in a timely manner.

Thank you,  
Charlotte Milan  
19 Bellevue Road  
Arlington, MA

--

Charlotte Milan



**ChargePoint, Inc.**  
254 East Hacienda Avenue | Campbell, CA 95008 USA  
+1.408.841.4500 or US toll-free +1.877.370.3802

Commissioner Martin Suuberg  
Massachusetts Department of Environmental Protection  
1 Winter Street  
Boston, MA 02108

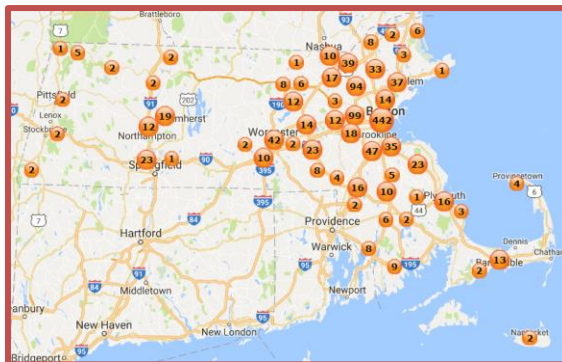
November 15, 2016

RE: Proposed new greenhouse gas regulations offered by the Massachusetts  
Department of Environmental Protection (MassDEP)

Dear Commissioner Suuberg,

ChargePoint is pleased to offer comments regarding the potential new greenhouse gas regulations that were presented and discussed at stakeholder hearings on November 2 and November 3. I attended the November 3 hearing in Boston and appreciated the thoughtful presentations, and the opportunity to ask questions and provide feedback.

ChargePoint is the world's largest and most open electric vehicle (EV) charging network, with more than 31,000 Level 2 and DC fast charging spots, including more than 1,240 spots in Massachusetts. Every 4 seconds, a driver connects to a ChargePoint station and by initiating over 19.4 million charging sessions. ChargePoint drivers have driven over 467 million gas free miles.



*Fig. 1: ChargePoint spots in Massachusetts*



The Commonwealth of Massachusetts has been a national leader in clean transportation policy, and we applaud these proposed regulations as they strive to expand the state's efforts to meet the goals of the Global Warming Solutions Act. As MassDEP magnifies its review of the transportation sector to determine more immediate and comprehensive ways to address the harmful effects of global warming, ChargePoint would like to be a partner and resource in that effort. ChargePoint fully supports setting ambitious targets for electrifying the Commonwealth's motor vehicle fleet, as well as welcomes further study into full range of options for fleet electrification, from regional transit authorities to vehicles used by contractors undertaking services on behalf of the Commonwealth.

### **Requirements for Transportation**

#### **ChargePoint supports the proposed:**

- Deeper dive into the overall calculation and reporting metrics.
- Stronger investment in electrification efforts for buses under DOT's purview, as well as throughout all public fleets in Massachusetts.
- Further dialogue on the benefits of electric vehicle fast charging.

#### **ChargePoint respectfully suggests:**

- Prioritization of VW Settlement investments in EV infrastructure and bus electrification to further the goals of Section 3(d) of the Global Warming Solutions Act, as well as Executive Order 569.
  - Appendix D of the VW Settlement allocates funding to support state-directed mitigation actions.
  - Massachusetts has been allocated \$69M, up to 15% of which (\$10.3M) may be invested in light duty EV infrastructure.
  - ChargePoint recommends that Massachusetts dedicate its entire 15% carve out towards electric vehicle charging infrastructure.
    - Incentives should be structured simply through rebates to support competition and allow multiple vendors and business models to participate in any program
    - EV charging station site hosts should be required to have "skin in the game" and provide private match, which will stretch the value of the investment and lead to more efficient siting of infrastructure
    - Programs should be developed in collaboration with neighboring states to establish EV fast charging corridors, including those recently identified by the Federal Highway Administration

- Infrastructure deployment should focus on areas of greatest need, including multifamily housing, disadvantaged communities, and workplaces
- That the remaining 85% of investments be focused on state, regional, municipal, and school bus electrification programs.
- “EV Ready” requirements for new construction be included in the State Building Code.
  - Including such a requirement would play a critical role in supporting the growth in EV adoption while also avoiding unnecessary costs associated with retrofitting buildings after construction is complete.
  - The incremental cost of including underlying infrastructure to support EV charging stations in the construction project can be 85% less than the cost of retrofitting an unprepared site.
  - An “EV Ready” requirement is currently being considered for inclusion in the 9<sup>th</sup> Edition of the State Building Code by the Board of Building Regulations and Standards.
  - Including the proposed “EV Ready” requirement would lower the barrier for potential site hosts to enter into the EV charging market, increase access to EV charging, and avoid costs in deploying sufficient EVSE to achieve the Commonwealth’s commitment to get 300,000 EVs on the road by 2025.

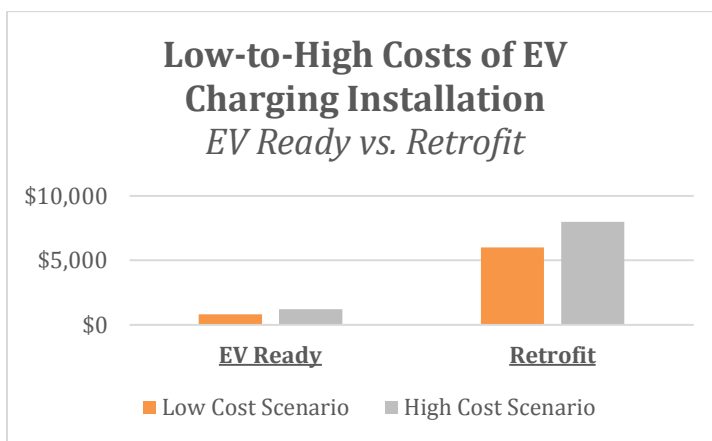


Chart 1: Average installation costs for EV charging stations per port



### **Requirements for State Fleet Vehicles**

#### **ChargePoint supports the proposed:**

- Lead by example approach; limiting greenhouse gas emissions from its own fleets will better position the Commonwealth as a national leader and strong voice on the issue of climate change control.
- Appointment of a Climate Change Coordinator at each executive agency who will be charged with implementing and following the new regulations at said agency, including reporting deadlines and proposed CO2 cap levels.

#### **ChargePoint respectfully suggests:**

- DEP further explore the possibility of implementing the same requirements on quasi-public agencies fleet, as well as collaborating with constitutional offices, counties, sheriffs, and municipalities to encourage fleet electrification efforts across all public fleets.
- Consideration for alternative approaches to annual CO2 emissions caps for fleets:
  - Pending legislation before the Massachusetts General Court<sup>1</sup> specifically calls for 25% of motor vehicles purchased annually by the Commonwealth to be zero emission vehicles by 2025
  - New York City recently committed to convert all nonemergency sedans to electric vehicles by the end of 2017 as part of its goal to cut municipal vehicle emissions in half by 2025, and 80 percent by 2035
- Investments in fleet electrification could be partially supported with associated fuel savings on the operating budget, particularly when fleet charging takes place overnight to take advantage of lower rates. The development of innovative rates to incentivize charging to take place during off-peak hours could augment avoided costs.
- Consideration of leveraging all available resources to support the achievement of regulatory targets. Fleet replacement programs are already supported on the Commonwealth's five-year capital plan (e.g., \$10M for the State Police Cruiser Replacement Program). Moreover, fleets electrification programs represent an opportunity to tie capital investments to operational savings, such as with the Accelerated Energy Program at DOER.

I truly appreciate the opportunity to comment on your proposed regulations, and your attention to my remarks. ChargePoint looks forward to continue working with both the

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<sup>1</sup>"An Act promoting zero emission vehicle adoption" (Senate, No. 2505)



Baker-Polito Administration and Massachusetts legislature to expand clean, innovative technologies options, in order to reduce dangerous CO2 emissions.

Please don't hesitate to use the contact information below should you have further questions or comments.

A handwritten signature in black ink, appearing to read "Kevin Miller", written over a light gray rectangular background.

Kevin George Miller  
Director, Public Policy  
ChargePoint

**COMMONWEALTH OF MASSACHUSETTS**  
**DEPARTMENT OF ENVIRONMENTAL PROTECTION**

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MASSACHUSETTS CLEAN ENERGY  
STANDARD

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NOVEMBER 21, 2016

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**COMMENTS OF  
RETAIL ENERGY SUPPLY ASSOCIATION  
RE DISCUSSION DOCUMENT**

The Retail Energy Supply Association (“RESA”)<sup>1</sup> hereby submits its comments in response to the Department of Environmental Protection’s (“Department” or “DEP”) Clean Energy Standard Discussion Document (“Discussion Document”). RESA appreciates the opportunity to comment on this important matter.

**INTRODUCTION**

RESA is a non-profit organization and trade association that represents the interests of its members in regulatory proceedings in the Mid-Atlantic, Great Lakes, New York and New England regions. RESA members are active participants in the retail competitive markets for electricity, including the Massachusetts retail electric market. Several RESA member companies are licensed by the Department of Public Utilities (“DPU”) to serve residential, commercial and industrial customers in Massachusetts and are presently providing electricity service to customers in the Commonwealth. As such, RESA and its members have an interest in ensuring that the creation of a new Clean Energy Standard (“CES”) does not have an adverse effect on

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<sup>1</sup> The comments expressed in this filing represent the position of the Retail Energy Supply Association (RESA) as an organization but may not represent the views of any particular member of the Association. Founded in 1990, RESA is a broad and diverse group of more than twenty retail energy suppliers dedicated to promoting efficient, sustainable and customer-oriented competitive retail energy markets. RESA members operate throughout the United States delivering value-added electricity and natural gas service at retail to residential, commercial and industrial energy customers. More information on RESA can be found at [www.resausa.org](http://www.resausa.org).

RESA members, their customers or the continued success of the retail electric market in Massachusetts.

## **BACKGROUND**

In early January 2015, DEP published a proposed CES regulation for public comment. Due to reviews required under Executive Order 562, DEP postponed the hearings and comment period on the CES.

On May 17, 2016, the Supreme Judicial Court of Massachusetts ruled that the Massachusetts Global Warming Solutions Act (“GWSA”) requires DEP to promulgate new regulations that “impose a limit on [greenhouse gas] emissions that may be released, limit the aggregate emissions released from each group of regulated sources or categories of sources, set emission limits for each year, and set limits that decline on an annual basis” to meet the requirements of GWSA section 3(d).<sup>2</sup> On September 16, 2016, Governor Baker signed Executive Order 569, which directed DEP to promulgate regulations that satisfy the mandate of Section 3(d).

In response, DEP held a series of stakeholder meetings including a retail electricity sellers stakeholder meeting (“Stakeholder Meeting”). During that meeting, DEP provided the Discussion Document and offered interested stakeholders an opportunity to comment. RESA now hereby submits its comments in response to the Discussion Document.

## **COMMENTS**

While RESA acknowledges that DEP is required to adopt regulations pursuant to Section 3(d) of the GWSA, neither the GWSA nor the *Kain* decision requires that DEP adopt a CES

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<sup>2</sup> *Kain v. Department of Env'l Protect.*, 474 Mass. 278, 292 (2016).

applicable to retail sellers of electricity.<sup>3</sup> Instead, the GWSA requires only that retail electricity providers be required to report greenhouse gas emissions (“GHG”), which has already been done.<sup>4</sup> Specifically, the GWSA requires DEP to “require **reporting** of greenhouse gas emissions from generation sources producing all electricity consumed, including transmission and distribution line losses from electricity generated within the commonwealth or imported from outside the commonwealth; provided, however, that this requirement shall apply to all retail sellers of electricity, including electric utilities, municipal electric departments and municipal light boards . . . .”<sup>5</sup>

The adoption of a CES will increase the cost to ratepayers for electric generation service, whether the customers remain on Basic Service or select a competitive supplier. As a general matter, even though competition exists, the more costs that are imposed on all providers in a market, the less options that are available to customers to reduce costs by selecting one provider over another. This is especially true when those costs cannot be mitigated in some way, such that all providers essentially pay the same costs. Because the Renewable Energy Credit (“REC”) market is not liquid beyond the very near term, suppliers are not able to hedge the costs that they incur to provide cleaner energy to consumers; costs that are passed onto ratepayers as higher prices. Thus, rather than imposing a CES and the associated costs on all retail electricity suppliers and, ultimately, ratepayers, RESA requests that the Department consider other

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<sup>3</sup> Cf. GWSA Regulations – Retail Electricity Sellers Stakeholder Meeting Presentation Slides (“Presentation Slides”), at 6 (acknowledging that Section 3(d) of the GWSA does not require a Clean Energy Standard for Retail Sellers).

<sup>4</sup> *Kain*, 474 Mass. at 284 (“It is undisputed . . . that the [D]epartment met each of the statutory deadlines, except for the deadline for promulgating the § 3 (d) regulations. The [D]epartment promulgated initial emission reporting regulations in December, 2008 . . . and amended the reporting requirements of the regulations in June, 2009, to address reporting by sellers of retail electricity.”).

<sup>5</sup> M.G.L. c. 21N, § 2(a)(5) (emphasis added).

alternatives that will permit it to satisfy the GWSA's goals while keeping the cost to ratepayers as low as possible.

In the event the DEP moves forward with the CES, RESA requests that the Department ensure that the CES provides for as much quantity certainty as possible, allows compliance flexibility and is instituted on a prospective basis only and in a competitively neutral fashion.

**I. THE CES PROGRAM DESIGN SHOULD PROTECT EXISTING RATEPAYER AND COMPETITIVE SUPPLIER EXPECTATIONS**

In the Discussion Document, the Department requested input on when the CES should start and whether the CES should remain in effect until 2050.<sup>6</sup> An important design element of any new program is to ensure that it does not disrupt or otherwise harm existing stakeholder expectations. As the Department most certainly appreciates, the competitive electricity market in the Commonwealth continues to advance and retail electricity suppliers continue to enter into contractual obligations, often with multi-year terms of service, while new regulations are being proposed and promulgated by the Department. However, retail electricity suppliers do not take market positions or enter into agreement terms with customers based simply on the announcement that a regulatory change may occur or even based on the release of proposed regulatory revisions. Rather, since announced or even proposed regulatory revisions are subject to change based on legislative considerations as well as the regulatory input process, retail electricity suppliers take market positions and enter into agreements based only on actual regulatory requirements officially promulgated by the governing regulatory authority. In this way, customers are not exposed to unnecessary price increases and/or pricing volatility as a result of speculative regulatory changes that may never be adopted or that may be significantly

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<sup>6</sup> See Discussion Document.

modified through the regulatory process before such changes ultimately become effective. Accordingly, retail electricity suppliers have entered into and will continue to enter into agreements with customers based on their current obligations. Only once the Department officially promulgates the CES will retail electricity suppliers modify their market positions and/or the terms of their agreements with customers to account for any new or modified regulatory requirements. Thus, in order to avoid disrupting the majority of these existing agreements, RESA requests that the CES not be effective until at least 2020.<sup>7</sup>

Furthermore, because retail electricity suppliers enter into multi-year agreements, even if the Department does not require compliance with the CES until 2020, some customers with fixed price arrangements will still be faced with unexpected price increases to account for the new obligation if steps are not taken to protect current expectations. When a new obligation is imposed, it impacts existing contracts that were priced based on any prior obligation and may have a term of service that extends over multiple years. While retail electricity suppliers may have contractual and legal means to address change of law circumstances, these mechanisms will have a direct and immediate financial impact to residential, business, governmental and institutional customers, who have contracted for a fixed price and will now be subject to new and unanticipated charges that are not within their budgets. These unanticipated charges place customers in an untenable position as they may be required to retroactively pay these costs per

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<sup>7</sup> Earlier this month, the U.S. Energy Information Administration (“EIA”) released updated 2014 CO<sub>2</sub> emissions data showing that Massachusetts has achieved economy-wide CO<sub>2</sub> emissions reductions of 24% since 1990; just one percent (1%) below the 2020 mandate. The electric generation sector, which has cut CO<sub>2</sub> emissions to nearly 60% below 1990 levels, has been the primary driver of these reductions. In fact, the electricity sector has dramatically out-performed every other sector in cutting CO<sub>2</sub> emissions and now represents only a third of the emissions from the transportation sector. The incremental 1% reduction necessary to meet the 2020 goals should be achievable with modest emphasis on other sectors, such as transportation. *See* EIA State Carbon Dioxide Emissions (available at: <http://www.eia.gov/environment/emissions/state/>). Thus, delaying implementation until 2020 will not impede the Commonwealth’s ability to satisfy its goals.

the terms of their contractual agreements. The retroactive cost impact is particularly difficult for local and state governments as well as institutional customers like hospitals and colleges that generally have limited budgetary flexibility. Moreover, they undermine the customers underlying confidence that the competitive electricity market can provide and deliver the type of pricing products they desire and have contracted to meet their energy needs. Accordingly, RESA requests that the Department choose an effective date as far out into the future as possible and that is at least three (3) years from the date the CES is adopted (i.e., 2020). In addition, because some contracts have even longer terms (e.g., 5 or 10 years), consistent with the policy adopted on numerous occasions by the Department of Energy Resources and on which customers have come to rely, the DEP should also include a provision in the CES that will exclude any contract executed or extended prior to the effective date of the CES from that compliance obligation.<sup>8</sup>

Once the CES is implemented, the Department should also provide for a process that would allow it to evaluate whether to delay any annual increase in the CES standard in future compliance years as has been done in other New England states. For instance, pursuant Rhode Island General Laws section 39-26-6(d), the Rhode Island Public Utilities Commission (“RI PUC”) was required to determine, on or before January 1, 2010 and on or before January 1, 2014, the adequacy, or potential adequacy, of renewable energy supplies to meet the increase in the percentage requirement of energy from renewable energy resources to go into effect in 2011

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<sup>8</sup> See, e.g., 225 C.M.R. 14.07(2)(a)2 (“The Compliance Year 2013 Solar Carve-out Minimum Standard applied to Retail Electric Suppliers shall remain at 0.2744% for that portion of electrical energy sales that were subject to a contract executed or extended prior to June 7, 2013, provided the Retail Electric Supplier provides documentation, satisfactory to the Department [of Energy Resources], identifying the terms of such contracts including but not limited to, the execution and expiration dates of the contract and the annual volume of electrical energy supplied.”).



and 2015, respectively.<sup>9</sup> If the RI PUC determined that an inadequacy or potential inadequacy existed, it was required to delay the implementation of the scheduled percentage increase for a period of one year or recommend a revised schedule of percentage increases.<sup>10</sup> The RI PUC determined that there was indeed insufficient renewable energy resources and, as a result, delayed the implementation of the scheduled increase for the year 2015.<sup>11</sup>

Similarly, the New Hampshire Public Utilities Commission (“NH PUC”) may “delay by up to one year, any given year's incremental increase in class I or II renewable portfolio standards requirement . . . .”<sup>12</sup> The NH PUC may also modify the Class III and IV renewable portfolio standards requirements so that those requirements account for the reasonably expected potential annual output of available resources.<sup>13</sup> Pursuant to New Hampshire RSA 362-F:4, the NH PUC determined that there was insufficient renewable energy resources and, as a result, reduced the Class III RPS requirements for calendar years 2014 and 2015.<sup>14</sup>

These market mechanisms provide a means by which states can evaluate how the market is developing and continue to support and promote their renewable policies but in a way that

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<sup>9</sup> R.I.G.L. § 39-26-6(d) (2015). This provision was subsequently revised in 2016 to require the RI PUC to “[d]etermine, on or before January 1, 2019, and every fifth year thereafter, the adequacy of renewable-energy supplies to meet the increase in the percentage requirement of energy from renewable-energy resources to go into effect the following year.”

<sup>10</sup> *Id.* Pursuant to the 2016 revisions, if the RI PUC “determines an inadequacy of supplies for scheduled percentage increases, the commission shall delay all or a part of the implementation of the scheduled percentage increase, until such time that the commission determines that the supplies are adequate to achieve the purposes of” the renewable energy standard.

<sup>11</sup> See RI PUC Docket 4404, *Investigation Pursuant to R.I.G.L. Sec. 39-26-6(d) to Determine the Adequacy or Potential, of Renewable Energy Supplies to Meet the Increase in the Percentage Requirement of Energy from Renewable Energy Resources in 2015*, Report and Order (Feb. 10, 2014) (available at: [http://www.ripuc.org/eventsactions/docket/4404-RES-Adequacy-Ord21353\\_2-10-14.pdf](http://www.ripuc.org/eventsactions/docket/4404-RES-Adequacy-Ord21353_2-10-14.pdf)).

<sup>12</sup> NH RSA 362-F:4, V.

<sup>13</sup> NH RSA 362-F:4, VI.

<sup>14</sup> See NH PUC Docket DE 15-035, *Electric Renewable Portfolio Standard, RSA 362-F:4, V and VI, Adjustments to Renewable Class Requirements*, Order No. 25,768 (Order Modifying Class III Requirements for 2014 and 2015 Compliance Years) (Mar. 13, 2015) (available at: <https://www.puc.nh.gov/Regulatory/Docketbk/2015/15-035/ORDERS/15-035%202015-03-13%20ORDER%20NO.%2025-768.PDF>).

reasonably contains the cost of compliance with such programs. Thus, in order to control ratepayer costs, as part of the CES, RESA urges the Department to provide for a process that allows for the periodic review of the standard and to determine whether the annual standard increase should be delayed.

## **II. THE CES PROGRAM DESIGN SHOULD PROVIDE AS MUCH QUANTITY CERTAINTY AS POSSIBLE**

In the Discussion Document, the DEP requested input on what the CES standard should be each year or how should it be determined.<sup>15</sup> Pursuant to the GWSA, the Department is required to adopt regulations that reduce GHG below 1990 levels by 80% by 2050. In an attempt to meet this goal, the Department is evaluating regulations for the transportation, electric generation (including retail sellers), and natural gas sectors.

Although retail electricity suppliers can act as a conduit for and support the Commonwealth's renewable energy and energy efficiency goals, they do not have the ability to directly reduce GHG emissions. Thus, in determining the appropriate standard, RESA recommends that the Department first determine the quantity of GHG reductions it expects to achieve from other sector participants, such as transportation, electric generator and natural gas distribution companies. In making those determinations, the Department should consider the emissions reductions that it expects will be achieved by other state programs, such as the requirement that electric distribution companies ("EDCs") enter into long-term contracts with clean energy resources.<sup>16</sup> Once the DEP makes those determinations, it should then evaluate

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<sup>15</sup> See Discussion Document.

<sup>16</sup> See *An Act to Promote Energy Diversity*, Chapter 188 of the Acts of 2016, § 83D ("In order to facilitate the financing of clean energy generation resources, not later than April 1, 2017, every distribution company shall jointly and competitively solicit proposals for clean energy generation and, provided that reasonable proposals have been received, shall enter into cost-effective long-term contracts for clean energy generation for an annual amount of electricity equal to approximately 9,450,000 megawatts-hours.").

what (if any) percentage deficiency it still expects and determine how much of that deficiency retail electricity suppliers can realistically help to provide over time.

Once the Department determines that quantity, RESA urges the Department to provide known quantity certainty regarding retail electricity suppliers' CES compliance obligations as far into the future as possible. Otherwise, customer contracts are likely to include a substantial risk premium to protect retail electricity suppliers from future quantity risk. In particular, RESA proposes that, at the time the CES is adopted, the Department publish a schedule that establishes the compliance obligation for the entire compliance period. By establishing a specific and known forward compliance obligation, the Department can eliminate the quantity risk premium in the majority of customer contracts. Conversely, if the Department does not provide quantity certainty, customers with multi-year fixed price arrangements will be faced with increased risk premiums to account for the quantity uncertainty in the later years of those agreements.

In Massachusetts, nearly all load is served, directly or indirectly, by competitive suppliers, who either provide wholesale service to the EDCs and municipals or who provide retail service directly to end-use customers. These suppliers are already subject to a Renewable Energy Portfolio Standard ("RPS")<sup>17</sup> and an Alternative Energy Portfolio Standard ("APS").<sup>18</sup> The CES would require retail electricity sellers to purchase additional clean energy based on a share of annual sales using New England Power Pool Generation Information System ("NEPOOL GIS") certificates for compliance.<sup>19</sup> This "clean energy" will include "RPS-eligible renewables and also other non-emitting technologies such as large hydropower."<sup>20</sup>

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<sup>17</sup> See, generally, 225 C.M.R. 14.00; 225 C.M.R. 15.00.

<sup>18</sup> See, generally, 225 C.M.R. 16.00.

<sup>19</sup> Presentation Slides, at 10, 11.

<sup>20</sup> Presentation Slides, at 10.

To meet their RPS obligations, suppliers enter into contracts for RECs. In deciding what REC purchases to make, retail electricity suppliers face several risks. If the price of RECs goes up and no hedges have been purchased, then the suppliers are stuck having to cover compliance obligations in a high price market. It would, therefore, seem prudent to cover at today's REC prices with a forward purchase and to bundle the cost of those RECs into the sales price to the customer. Balanced against this, however, is the risk associated with the imposition of new retail electricity supplier obligations such as the CES.

Faced with an uncertain regulatory environment, retail electricity suppliers will seek to manage the regulatory risk that the Department will introduce new compliance obligations in one of several ways. First, by shortening the length of their retail load serving contracts, perhaps to 12 months or less, retail electricity suppliers and their customers can re-price and re-negotiate at the time of annual renewal; thereby, shifting the risk associated with compliance obligation changes to customers. Alternatively, retail electricity suppliers can offer longer term contracts for electricity with a pass-through for compliance costs. This shifts the regulatory risk from the retail electricity suppliers to customers but also undercuts the retail electricity suppliers incentive for REC hedging for customers. As a third option, retail electricity suppliers could build a significant risk premium into the cost associated with compliance to ensure that future regulatory changes do not create potentially uneconomic contracts. This risk premium will then be reflected in the prices paid by consumers. By contrast, by setting compliance obligation requirements for an extended period, the Department can send a message that it is safe to continue to invest in the Commonwealth and avoid potential negative impacts to customers.

A standard that fails to provide a transparent and predictable future quantity compliance obligation creates uncertainty that forces retail electricity suppliers to estimate their obligations

and to include a significant premium in what they charge consumers to protect against that risk. Furthermore, if the compliance obligation is ultimately less than the retail electricity suppliers estimated, customers will have paid more for CES compliance than was actually necessary. Conversely, by providing quantity certainty, the Department can eliminate risk premiums associated with such uncertainty; resulting in lower prices for consumers. Thus, RESA urges the Department to adopt known quantity schedules for the entire CES compliance period that allow businesses to manage their affairs more effectively and reduce risk premiums; thus, mitigating costs to end-use customers.

### **III. THE CES PROGRAM DESIGN SHOULD PROVIDE FOR AS MUCH LIQUIDITY IN THE MARKET AS POSSIBLE**

In the Discussion Document, the Department also requested comment on eligibility for clean generators, including whether it should create a list of eligible technologies and/or limit eligibility to “new” technologies.<sup>21</sup> In order to provide the most flexibility in the market, RESA recommends that the Department permit any type of resource that will help the Commonwealth to meet its GHG reduction goals, including large and small resources, and behind-the-meter and grid-side technologies.

Pursuant to the GWSA, the Department is required to reduce GHG emissions below 1990 levels. Thus, any electric generator that reduces emissions below those levels should be eligible as a clean generator. In this way, the Department can ensure that it does not cause the retirement of existing zero emission or low emission generation resources that would otherwise contribute to cost-effectively attaining the emission reduction targets because they are not given the same incentives as “new” generators. By ensuring that the broadest set of resources are eligible, the

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<sup>21</sup> See Discussion Document.

Department can also maximize liquidity in the CES certificate market and, as a result, reduce the cost of CES certificates and minimize the cost impacts to ratepayers. Thus, RESA requests that the Department permit any type of resource, including large and small resources, and behind-the-meter and grid-side technologies, that will help the Commonwealth to reduce GHG emissions below 1990 levels.

#### **IV. THE CES PROGRAM DESIGN SHOULD PROVIDE COMPLIANCE FLEXIBILITY**

In order to further control ratepayer costs, RESA requests that the Department also ensure that the CES provides retail electricity suppliers the flexibility to determine the most cost effective way to undertake market-driven measures to optimize their portfolio and satisfy their compliance obligations. To this end, RESA urges the Department to develop an alternative compliance payment (“ACP”) and permit banking of CES certificates; both of which will reduce the cost of compliance and minimize the cost impacts to ratepayers.

Without an ACP, in years where there are not sufficient CES certificates available to permit all retail electricity providers to meet their compliance obligations, there will be no other manner in which to achieve compliance; thereby, creating market uncertainty. Moreover, even in years where there may be sufficient CES certificates available, if they are controlled by a small number of generators, those generators would be able to exert significant market power over those certificates; thereby, resulting in higher costs that will ultimately be borne by ratepayers.

An ACP recognizes that there may not be sufficient CES certificates available in the market at a reasonable price and, as a practical matter, places a ceiling on the price of CES certificates. In doing so, it avoids a small number of generators being able to artificially increase

the price of certificates and the resulting costs borne by ratepayers. It also avoids consumers having to bear the expense for clean energy at any price. For instance, if only two generators are eligible, those two generators may not be able to produce a sufficient number of CES certificates for all of the retail electricity providers to satisfy the CES. This will send a signal to the market that more clean generation is necessary; thereby, encouraging competition consistent with the principles of the Restructuring Act.<sup>22</sup> However, without an ACP, the cost of that new generation will not be capped in any way; thus, suppliers could end up paying exorbitant prices for CES certificates to satisfy their compliance obligations with those costs ultimately being borne by ratepayers. By instituting an ACP, the Department can ensure that the CES does not cost ratepayers more than is necessary and incent generators to build competitively priced facilities. An ACP will also provide the Department with an indication of how the market is functioning and provide the Department with appropriate signals to determine if there is a need to make adjustments to the administratively set CES standard to account for how the market is functioning. Thus, RESA requests that the Department include an ACP in the CES regulations.

For many of the same reasons, RESA also encourages the Department to permit retail electricity suppliers to bank CES certificates. Without banking, the market for CES certificates will be limited not only by the number of clean energy generators but also by time. When supply is limited, prices increase. In order to provide a hedge against those price increases, retail electricity suppliers should be permitted to bank CES certificates. Banking allows retail electricity suppliers to meet their obligations in the most efficient and cost effective way and to manage their obligations as the amount of load they serve changes. Thus, RESA urges the

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<sup>22</sup> *An Act Relative to Restructuring the Electric Utility Industry in the Commonwealth, Regulating the Provision of Electricity and Other Services, and Promoting Enhanced Consumer Protections Therein*, Chapter 164 of the Acts of 1997.

Department to permit retail electricity providers to bank CES certificates and to do so to the maximum extent possible by refusing to limit the quantity of CES certificates that a supplier can bank or the future time period during which banked certificates can be used for compliance. By providing this flexibility, the Department can reduce the cost of overall CES compliance; thereby, controlling ratepayer costs.

## **V. THE CES PROGRAM DESIGN SHOULD BE COMPETITIVELY NEUTRAL**

In the Discussion Document, the Department requested comment on whether municipal light plants should be required to comply with the CES.<sup>23</sup> Simply put, yes. Just like every other plant in Massachusetts, municipal light plants contribute to GHG emissions and should concomitantly be required to contribute to their reductions.

Imposing the CES on municipal light plants will also ensure that the obligation is instituted in a competitively neutral fashion. Because municipal light plants are exempt from numerous regulatory requirements, retail electric suppliers are already faced with questions from customers about why they can purchase power for a significantly lower cost from municipalities. Permitting municipal light plants to forego the obligations of the GWSA will only further exacerbate this issue.

Moreover, in those cases in which municipal plants have been exempted from certain requirements, the legislature has done so explicitly.<sup>24</sup> In this case, the GWSA specifically imposes upon “municipal electric departments and municipal light boards” the requirements

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<sup>23</sup> See Discussion Document.

<sup>24</sup> See, e.g., M.G.L. c. 25A, § 11F(i) (“A municipal lighting plant shall be exempt from the obligations under this section so long as and insofar as it is exempt from the requirements to allow competitive choice of generation supply under section 47A of chapter 164.”).



applicable to retail electricity suppliers.<sup>25</sup> Accordingly, pursuant to the plain language of the GWSA, the CES should be applied to municipal light plants.

### **CONCLUSION**

For all of the foregoing reasons, RESA urges the Department to ensure that the CES provides for quantity certainty, includes compliance flexibility and is instituted on a prospective basis only and in a competitively neutral fashion.

Respectfully submitted,  
RETAIL ENERGY SUPPLY  
ASSOCIATION

By   
Joey Lee Miranda  
Robinson & Cole LLP  
280 Trumbull Street  
Hartford, CT 06103  
Phone: (860) 275-8200  
Fax: (860) 275-8299  
E-mail: [jmiranda@rc.com](mailto:jmiranda@rc.com)

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<sup>25</sup> M.G.L. c. 21N, § 2(a)(5) (“[T]his requirement shall apply to all retail sellers of electricity, including electric utilities, municipal electric departments and municipal light boards . . .”).

**From:** uma mirani

**Sent:** Thursday, November 17, 2016 2:01:56 PM (UTC-05:00) Eastern Time (US & Canada)

**To:** Strategies, Climate (DEP)

**Subject:** Un-repaired Methane Gas Leaks in Our State

TO: MA DEP

I am writing to express my concern about the number of gas leaks that have gone unattended by the utility companies in Massachusetts.

Recently it has come to my attention that there are at least 177 Natural Gas leaks in the town of Arlington alone and approximately 20,000 statewide. There are streets in Arlington where one can actually smell the leaking gas.

The methane from the Natural Gas leaks is bad for our health, bad for the plant life around us, adds to the warming of the planet and could pose a safety hazard. Also, we, the consumers, are the ones paying for lost and unaccounted for gas.

For all these reasons, we need strict regulations to ensure that the gas companies fix all gas leaks. Identifying and fixing the largest leaks (the "super-emitters") should happen as soon as possible, but we also want all other gas leaks fixed in a timely manner.

Sincerely,  
Uma Mirani  
Somerville, MA



TO: MA Department of Environmental Protection

FROM: Mothers Out Front

DATE: November 16, 2016

We appreciate this opportunity to comment on proposed regulations to cap greenhouse gas emissions in accordance with the Global Warming Solutions Act and as required by Governor Baker's Executive Order concerning limits on emissions from the natural gas delivery system. We are members of Mothers Out Front, a growing grassroots organization of mothers, grandmothers and others deeply committed to protecting the environment and creating a sustainable, clean energy future for all of our children and generations to come.

Our network of community teams across Massachusetts has been working diligently to cast attention and build support for action to address the thousands of gas leaks in Massachusetts. We work with many allied organizations that share our concern for this issue. Due to this work, thirty-seven Massachusetts cities and towns, representing over 30% of the population, have passed resolutions in support of legislation to reduce emissions by fixing the leaks efficiently and effectively.

We have built a growing base of informed activists who are specifically concerned about the accuracy of data put forth by the natural gas utilities and about the non-representative national data used to calculate baseline

and current methane emissions in MA. **Calculations need to be based on empirical data from the scientific community using the best available technologies for measurement and analysis. If we are to accurately reduce emissions we need verifiable metrics and if we are to build trust, we need transparency.**

The requirement of the Global Warming Solutions Act and the Governor's Executive Order 569 offer an **opportunity to get this right**. We are fortunate to have scientists in the Boston community who can help the DEP do that. They have done research on GHG emissions for years and can inform this process based on the science. Therefore, we write in support of the letter submitted by Dr. Margaret Cherne-Hendricks, Dr. Nathan Phillips, and Dr. Lucy Hutyra, all of Boston University and urge your serious consideration of their concerns and proposed recommendations.

Thank you for considering our comments,

**Mothers Out Front,**

**Massachusetts Leadership Team**

Debbie New, Randi Soltysiak, Eugenia Gibbons, Sue Stafford, Maura Ramsey, and Anne Goodwin

**From:** Brucie Moulton

**Sent:** Tuesday, November 15, 2016 10:35:13 PM (UTC-05:00) Eastern Time (US & Canada)

**To:** Strategies, Climate (DEP)

**Subject:** supporting regulations re methane leaks from natural gas distribution system

I am writing to express my serious concern about the number of natural gas leaks that have gone unattended by the utility companies in Massachusetts. I recently learned that in my town of Arlington there are at least 177 natural gas leaks and, statewide, there are about 20,000. Some of these leaks have been active for 5 years or more, and a few for up to 20 years

The methane from the natural gas leaks is helping to make climate change happen faster, is injurious to our health, harms plants and trees around us, and, occasionally causes explosions. Also, we, the consumers, are the ones paying for lost and unaccounted for gas and this bill is hardly trivial.

For all these reasons, we need strict regulations to ensure that the gas companies fix all gas leaks. Identifying and fixing the largest leaks (the "super-emitters") should happen as soon as possible, but we also want all other gas leaks fixed in a timely manner.

Therefore, I strongly support the **New 310 CMR 7.73 - Reducing Methane Emissions from the Natural Gas Distribution System 5**, Executive Order 569:

“The Department of Environmental Protection shall promulgate final regulations that satisfy the mandate of Section 3(d) of [GWSA] by August 11, 2017, having designed such regulations to ensure that the Commonwealth meets the 2020 statewide emissions limit mandated by the GWSA....The Department of Environmental Protection shall: ...consider limits on emissions from, among other sources or categories of sources, the following: (i) leaks from the natural gas distribution system...” (September 16, 2016)

Thank you,

Sally B Moulton

(member of Vision 2020's Sustainable Arlington, a chapter of the Massachusetts Climate Action Network)

## M E M O R A N D U M

**TO:** Massachusetts Department of Environmental Protection  
**FROM:** Municipal Electric Association of Massachusetts  
**DATE:** November 21, 2016  
**RE:** Comments – MassDEP Clean Energy Standard Discussion Document

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On November 7, 2016, the Massachusetts Department of Environmental Protection (“MassDEP”) published the “MassDEP Clean Energy Standard Discussion Document” (“Discussion Document”). The Discussion Document was issued subsequent to: 1) the ruling by the Massachusetts Supreme Judicial Court (“SJC”) in *Kain, et al. v. Department of Environmental Protection*, 474 Mass. 287 (2016); and 2) the issuance of Executive Order 569 “Establishing an Integrated Climate Change Strategy for the Commonwealth.” Both the SJC’s ruling in *Kain* and Executive Order 569 address the promulgation of regulations by MassDEP pursuant to Chapter 21N of the Global Warming Solutions Act (“GWSA”).

The Discussion Document requests stakeholder feedback regarding the options for implementing a Clean Energy Standard (“CES”). Specifically, stakeholders are asked to focus their comments on a list a substantive ways in which the CES may differ from the 2015 proposal (*i.e.* proposed regulation 310 CMR 7.75).

Included in the list of potential substantive differences is the question, “Should municipal light plants be required to comply?” The Municipal Electric Association of Massachusetts (“MEAM”) responds to this question that as a matter of law, the answer is “no.” The reasoning behind that response follows.

MEAM is a statewide association of all 40 municipal light departments in the Commonwealth of Massachusetts. On April 30, 2015, MEAM submitted comments addressing the 2015 CES proposal. In those comments, MEAM discussed in detail why the MassDEP should adopt a CES that specifically exempted all municipal light plants ("MLPs").

**(1) MassDEP has no statutory authority to require MLPs to comply with a CES regulation.**

**a. G.L. c. 21N's language shows MLPs should be exempt from a CES.**

G.L.c. 21N does not provide MassDEP with the authority to impose a CES regulation on MLPs either expressly or by implication. The express language of G.L. c. 21N does not mention MLPs, except for the reference in §2(a)(5), which mandates the reporting of greenhouse gas ("GHG") emissions from generation sources producing electricity consumed in the Commonwealth. The Legislature's silence on this point is meaningful and cannot be ignored. *Roberts v. Enter. Rent-A-Car Co. of Boston*, 438 Mass. 187, 193 (2002).

The lack of other references to MLPs in G.L.c. 21N clearly demonstrates that the Legislature did not intend to include MLPs in any those provisions. *American Honda Motor Co., Inc. v. Bernardi's, Inc.*, 432 Mass. 425, 431 (2000). As stated by the SJC, where the Legislature has employed specific language in one portion of a statute, but not in another, the language will not be implied where it is absent. *Simmons v. Clerk-Magistrate of Boston Div. of Hous. Court Dep't*, 448 Mass. 57, 64–65 (2006), citing, *Beeler v. Downey*, 387 Mass. 609, 616 (1982); *First Nat'l Bank v. Judge Baker Guidance Ctr.*, 13 Mass. App. Ct. 144, 153 (1982).

If the Legislature had intended MLPs to be included in all the provisions of c.21 N, there would have been no need to specifically refer to MLPs in §2(a)(5). Because a statute may not be construed in a manner that renders any of its provisions as superfluous, G.L.c. 21N cannot be read as if the reference is to MLPs in §2(a)(5) has no meaning or did not exist. *Souza v. Registrar of Motor Vehicles*, 462 Mass. 227, 233 (2012); *Thurdin v. SE/ Boston, LLC*, 452 Mass. 436, 444 (2008).

Also, there is nothing to suggest that authority to impose a CES regulation on MLPs should be implied. If fact, no such implication may arise in the face of such clear indications of the Legislature's intention to withhold such authority. *Life Insurance Association of Massachusetts v. Commissioner of Insurance*, 403 Mass. 410, 418 (1988). G.L.c. 21N must be interpreted as enacted. *Harris v. Town of Wayland*, 16 Mass. App. Ct. 583, 585 (1983). It is the role of the Legislature to designate when the regulation of MLPs is appropriate to accomplish the goal underlying the GWSA. MassDEP may not usurp that role. Rather, MassDEP must interpret c. 21N as the Legislature wrote it. *Id.*; *Providence and Worcester Railroad Co. v. EFSB*, 453 Mass. 135, 144 (2009) (agency's belief that it would be desirable to have a particular power did not justify the agency in claiming power the Legislature did not grant); *Souza*, 462 Mass. at 232-233 (policy preference of an administrative agency cannot alter the language of a statute and bestow upon the agency a power that the statute does not).

The express language of G.L. c. 21N does not bestow MassDEP with authority regarding MLPs except as to GHG emissions reporting requirements. *See Greater Boston Real Estate Board v. Board of Registration of Real Estate Brokers and Salesmen*, 405 Mass. 360, 363-64 (1989). MassDEP has no authority to require MLPs to comply with a CES regulation. *See Telles v. Comm'r. of Insurance*, 410 Mass. 560, 562-63 (1991).

**b. G.L.c.25A, §11F shows MLPs should be exempt from a CES regulation.**

Statutes on the same subject matter must be construed harmoniously so as to give rise to a consistent body of law. *Adoption of Marlene*, 443 Mass. 494, 500 (2005). The GWSA addresses the reduction of GHG emissions in the Commonwealth. This is the same subject addressed by the Green Communities Act, which includes and expands the Renewable Portfolio Standard ("RPS").

MLPs are expressly exempt from compliance with the RPS. G.L. c. 25A, §11F(i). In order to be construed harmoniously with G.L. c. 25A, §11F(i), G.L. c. 21N must be construed so as to exempt MLPs from a CES regulation. *Adoption of Marlene*, *id.*



The fact that G. L. c. 21N contains no provision expressly forbidding MassDEP from imposing a CES regulation on MLPs cannot substitute for the Legislature's clear intention to withhold such authority. The object of all statutory construction is to ascertain the true intent of the Legislature from the words used. *Simmons* 448 Mass. at 64–65. Words will not be added to a specific statute that the Legislature did not put there, either by inadvertent omission or by design. *Id.*

When read in its entirety, reasonably, and in the context of related statutes, G.L.c. 21N reflects the Legislature's intent to withhold from MassDEP authority to impose a CES regulation on MLPs. Therefore, the lack of a specific prohibition against MassDEP's imposing a CES regulation on MLPs does not equate to Legislature granting MassDEP to do so.

**c. An interpretation of G.L. c. 21N as bestowing MassDEP with the power to impose a CES on MLPs would be unreasonable.**

Unreasonable statutory interpretations cannot stand. *Franklin Office Park Realty Corp. v. Commissioner of the Department of Environmental Protection*, 466 Mass. 454, 460 (2013). The Legislature traditionally has refrained from imposing on MLPs the statutory and regulatory obligations applicable to investor-owned regulated utilities. *E.g.* G.L. c. 164, §§57, 58 (MLPs exempt from the requirement of procuring DPU approval of their rates and power purchase contracts); G.L. c. 164, §47A (MLPs exempt from competitive choice of generation supply), G.L. c.25A, §§11F(i) (MLPs exempt from RPS obligations).

In interpreting a statute, administrative agencies must be guided by the presumption that in enacting the statute, the Legislature was aware of other statutes on the same subject. *Charland v. Muzi Motors, Inc.*, 417 Mass. 580, 582 (1994). MassDEP must presume that the Legislature did not intend to work such a radical change from its historic treatment of MLPs as would occur if a CES regulation is imposed on MLPs without plain and unequivocal language to that effect. *Roberts v. Enterprise Rent-A-Car Boston*, 438 Mass. 187, 193 (2002).

“A matter may be within the letter of a statute and not come within its spirit,...if to include it would require a radical change in established public policy or in the existing law and the act does not manifest any intent that such a change should be effected.” *Suffolk Construction*, 449 Mass. at 458, *quoting Commissioner of Corps. And Taxation v. Dalton*, 304 Mass. 147, 150 (1939). An interpretation of G.L. c. 21N which allows MassDEP to require MLPs to comply with a CES regulation would be unreasonable because such an interpretation would require “a radical change in established public policy [and] the existing law and the act does not manifest any intent that such a change should be effected.” *Id.*

Moreover, the fact that the Green Communities Act, including and expanding the RPS, was enacted approximately one month prior to the GWSA supports the conclusion that MassDEP has no authority to require MLPs to comply with a CES regulation. It’s unreasonable to conclude that the Legislature would exempt MLPs from the requirement of selling energy generated by the technologies covered by the RPS but a few weeks later deprive MLPs of the same exemption from regulatory requirements promulgated under c. 21N. MassDEP cannot give itself the power to regulate MLPs when the Legislature did not see fit to do so simply by creating a category of generation technologies that is eligible for the CES but not for the RPS. *Early v. State Board of Retirement*, 420 Mass. 836, 839-840 (1995). Thus, it is unreasonable to interpret G.L. c. 21N as requiring MLPs to comply with a CES regulation. *Franklin Office Park Realty corp.*, 466 Mass. at 460.

## **(2) MLPs should not be equated with investor-owned utilities.**

The 2015 proposed CES regulation included MLPs in the definition of “Retail Electricity Seller or Retail Seller” along with investor-owned utilities (“IOUs”). This clearly ignores the vast and vital differences between MLPs and IOUs.

MLPs have no investors, are self-regulated and differ from IOUs. See *Donohue v. City of Newburyport*, 211 Mass. 561, 567 (1912). MLPs and IOUs are completely different types of entities governed by separate statutory schemes. G.L. c. 164, §2. IOUs are governed by G.L.

c. 164, §§1-1H, 3-33A, 76-102C. MLPs are governed by G.L. c. 164, §§34-69A, and can only operate pursuant to those laws.

IOUs are organized as profit making domestic corporations owned by shareholders. G.L. c. 164, §§ 3-8D, 23-24, 33. MLPs do not have shareholders, their return on plant is capped by statute, and they are run by public officials. G.L. c. 164, §§34, 58; *Municipal Light Commission of Taunton v. State Emp. Group Ins. Commission*, 344 Mass. 533 (1962).

Requiring MLPs to comply with a CES regulation not only improperly conflates MLPs with IOUs, but results in the MassDEP impermissibly usurping the ratemaking authority of MLPs by requiring the CES Alternative Compliance Payments (“CES ACP”).

MLPs are operated and managed by a single manager. The manager is a public officer appointed by the mayor in cities, the selectmen in towns, or the municipal light board in those cities and towns that elect or appoint a municipal lighting board. G.L. c. 164, §55, 56. As non-profit municipally-owned entities, the MLPs’ prime directive is to provide reliable, low cost electricity to the cities and towns’ residents and businesses.

MLPs are primarily regulated at the local level. The mayor, selectmen or municipal light board and the manager of the MLP fix the electricity prices charged by the MLP in accordance with a statutory formula. G.L. c. 164, §58. As public officers, they are entitled to legislative deference in fixing prices under legislative mandate. *Board of Gas and Elec. Com’rs of Middleborough v. Department of Public Utilities*, 363 Mass. 433 (1973).

Unlike IOU’s MLPs set rates in accordance with a statutory formula. G.L. c. 164, §§57, 58. The formula defines the minimum price in any rate schedule and the maximum price for all rate schedules. No price may be set at less than production cost. All schedules of prices may not yield more than 8% on the cost of plant, after payment of all operating expenses, interest on the outstanding debt, the requirements of any fund established to pay the debt, and an amount for depreciation equal to 3% of the cost of plant, or such smaller or larger amount as the Department of Public Utilities (“DPU”) may approve. G.L. c. 164, §58. All income for each fiscal

year must be used to pay for the annual expense of the plant for the fiscal year. Any surplus of the annual allowance for depreciation not used for replacing plant is held in a depreciation fund by the town treasurer for replacing plant in succeeding years, or for paying nuclear decommissioning costs, stranded costs or, upon DPU approval, any indebtedness issued to pay for plant replacements. G.L. c. 164, §57.

MassDEP has no authority over MLP's rates. Even DPU approval is not required for an MLP to change prices (unless it intends to deviate from the statutory formula). G.L. c. 164, §58. The DPU does not have authority to suspend the prices fixed by a municipal light board pending investigation, *Board of Gas and Elec. Com'rs of Middleborough v. Department of Public Utilities*, 363 Mass. 433 (1973), but it may investigate allegations of discriminatory practices. *Holyoke Water Power Co. v. City of Holyoke*, 349 Mass. 442 (1965).

In contrast, the DPU has jurisdiction over the entire rate structure of an IOU. The DPU is free to select or reject a particular method of IOU ratemaking as long as the choice is not confiscatory or illegal. *American Hoechst Corp. v. Department of Public Utilities*, 379 Mass. 408 (1980); *Massachusetts Electric Company v. Department of Public Utilities*, 376 Mass. 294 (1978); *Boston Edison Company v. Department of Public Utilities*, 375 Mass. 1 (1978).

IOUs are entitled to charge rates which afford them opportunity to meet their cost of service, including a fair and reasonable return on prudently invested capital. *Boston Gas Company v. Department of Public Utilities*, 367 Mass. 92 (1975). IOU ratemaking uses a test-year model under which the DPU examines a test period on the theory that the revenue, expense and rate base during that period accurately reflects the IOUs' present financial situation and fairly predicts its future performance. *Bay State Gas Company v. Department of Public Utilities*, 459 Mass. 807 (2011).

The DPU designs base rates using a cost allocation method that is based on equalized rates of return for each customer class, but if the method impacts any customer class by more than 10%, the DPU may phase in the elimination of any cross subsidies between rate classes

over a reasonable period. G.L. c. 164, §94I.

IOUs' prime directive is to make profits and pay dividends to shareholders. To balance this private directive with the public nature of a utility, the DPU has general supervisory authority over all IOUs. G.L. c. 164, §76. The overriding consideration in the DPU's regulatory and ratemaking scheme for IOUs is the public interest. *Attorney General v. Department of Telecommunications and Energy*. 438 Mass. 256 (2002).

The DPU may order an IOU to reduce or change its prices or improve the quality of its service. G.L. c. 164, §93. IOUs must file annual emergency response plans with the DPU. G.L. c. 164, §85B. They must also file all rates and contracts with the DPU not less frequently than every five years. Whenever an IOU seeks a change in rates, it must first file the proposed rates with the DPU for approval. IOUs must also file all contracts for the sale of electricity with the DPU, which may investigate the propriety of such contracts, and make orders relative to their rates and terms. G.L. c. 164, §94. The burden is on the IOU to show that its proposed rates are proper. *Metropolitan District Commission v. Department of Public Utilities*, 352 Mass. 18 (1967). In determining the propriety of rates, the DPU must find that they are just and reasonable. *Bay State Gas Company v. Department of Public Utilities*, 459 Mass. 807 (2011).

By requiring MLPs to comply with a CES regulation – which will require CES ACPs – MassDEP essentially would be appropriating the power afforded to local public officials who set the rates for MLPs.

**(3) G.L. c. 111 does not provide MassDEP with authority to require MLPs to comply with a CES regulation.**

Neither §142A nor §142B of G.L.c. 111 provides authority to include MLPs in a CES regulation. Section 142A authorizes MassDEP to promulgate regulations under other, specifically referenced, sections of c. 111, namely, §§142B through 142M. The purpose of §142B is to address air pollution through regulation of physical premises that are a source of air pollution.

Thus, the general statutory plan of c. 111 is the control of air pollution through regulation of air pollution sources (for example, residential, industrial or commercial premises (§142B), aircraft (§142F), burning of Christmas trees (§142G), ceremonial bonfires (§§142H and I), motor vehicles (§§142 J, K, and M), and agricultural burning (§142L)). A CES regulation would attempt to control air pollution through regulation of the power purchases of MLPs.

Sections 142A and 142B must be interpreted according to their plain language, in association with other sections of c. 111, and in accordance with the general statutory plan. *Commissioners of Bristol County Mosquito Control District v. Start Reclamation & Mosquito Control Board*, 466 Mass. 523, 529 (2013). Because §§142A and 142B focus on the sources of air pollution, they bear no relationship to a CES regulation of the power purchases of MLPs and thus cannot provide MassDEP with implied authority to require MLPs to comply with a CES regulation. See *Life Insurance Association of Massachusetts*, 403 Mass. 417–18 (where courts have found an implied authority to issue regulations, there has always been a rational relationship between the regulation and the purpose the statute viewed as authorizing the regulation); see also *Derby Refining Co. v. Board of Aldermen of Chelsea*, 407 Mass. 718, 722 (1990) (where the statutory plan concerned the regulation of fire hazards, board of aldermen had no authority to revoke a flammable storage license issued pursuant to the statute on the basis of environmental and health related concerns).

**(4) There is no need to impose a CES Regulation on MLPs because MLPs are already in line with the proposed CES.**

MLPs already have been working toward the goal of increasing the percentage of electricity sold in Massachusetts that is generated using non-emitting technologies. In 2013, MLPs nearly met the proposed 2020 CES of 30% of sales of energy from clean energy generators. AQ31 data previously submitted by MEAM to the MassDEP in MEAM's prior Comments shows that in 2013 28% of total MLP electric sales were from non-emitting

generation technologies. A significant number of MLPs have power supplies that already are more than 43% carbon free.

MLPs, under local control, have been keeping pace with the proposed CES without a mandate from MassDEP. This shows that, not only are MLPs perfectly able to self-regulate, but also that the Legislature correctly relied upon local MLP boards and public officials and excluded MLPs from all but the GHG emissions reporting requirement of c.21N. Thus, there is no need to impose an additional CES regulation on MLPs. Moreover, to do so would amount to MassDEP impermissibly substituting its judgment for the Legislature (or local MLP boards). See *Providence and Worcester Railroad Company*, 453 Mass. at 145.

While MassDEP has the power to adopt regulations to carry out the will of Legislature, such rulemaking authority is not the power to make law. *Id.* The will of the Legislature as expressed in c. 21N does not in any way support a requirement that MLPs comply with a CES regulation promulgated under c. 21N.

In addition, as noted in MEAM's April 30, 2015 comments, imposing additional clean energy requirements on MLPs would result in an unnecessary and unjustifiable cost burden for MLPs and their customers. As shown in Exhibit A to MEAM's April 30, 2015 comments, in 2020, based on 50% of the CES ACP value, the cost of making the CES ACPs (as contemplated in proposed 301 CMR 7.75) for the forty Massachusetts MLPs would be more than \$66 million. Imposition of such enormous costs effectively would eviscerate local control over such costs.

**(5) The SJC's decision in *Kain* does not support imposing a CES regulation on MLPs.**

In *Kain*, the SJC decided that MassDEP had not yet satisfied its obligation to promulgate regulations requiring decreases in the annual aggregate GHG emissions pursuant to G.L. c. 21N, §3 (d). In reaching its decision, the SJC concluded that neither the requirements of the Regional Greenhouse Gas Initiative ("RGGI") nor the Low Emission Vehicle program satisfied

the §3 (d) obligation to promulgate regulations. *Kain*, 474 Mass. at 297-300.

However, the SJC did not address whether such regulations should apply to MLPs and nothing in the *Kain* decision expressly or impliedly indicates that they should. In fact, the SJC noted that §3(c) “specifically carves out a separate process by which emissions levels and limits associated with the electric sector are established in consultation with the secretary and the Department of Energy Resources and are to take into account the RGGL.” *Id.* at 297. The SJC refused to construe §3(c) and §3(d) together as such a reading would “ignore the Legislature’s intent that regulations related to the electric sector be treated differently from regulations promulgated under §3(d).” *Id.*

The November 7, 2016 MassDEP stakeholder discussion slides for both the Emitting Electricity Generators Stakeholder Meeting and the Retail Electricity Seller Stakeholder Meeting hearken to §3(c) as a basis for a CES regulation. Section 3(c) provides for setting emissions levels and limits for the electric sector, taking into account, among other things, the RPS. MLPs are exempt from the RPS. This further supports the conclusion that MLPs should not be required to comply with a CES regulation.

#### **(6) Conclusion**

For the above reasons, MLPs should not be required to comply with a CES regulation.



**Sent:** Wednesday, November 16, 2016 11:17:11 PM (UTC-05:00) Eastern Time (US & Canada)  
**To:** Strategies, Climate (DEP)  
**Subject:** GHG Section 3d Comments

Ladies and Gentlemen of DEP:

I am an ordinary citizen – a retired person and life-long resident of Massachusetts – who has never before been associated with any environmental/energy-related business or issues, but one who is concerned with the health and quality of life for the inhabitants of this unique and fragile planet.

I see our world at a crisis point, but fortunately so do our Massachusetts legislature, government, and courts. The mandates that have been put in place are extremely important and necessary, and must be implemented at full speed by those agencies, such as yours, which are called upon and entrusted to do so. Clearly this is totally in keeping with the DEP's mission statement.

The prime directive of GWSA is to reduce greenhouse gases and other pollutants. This obviously means that, to meet its stringent deadlines, DEP must do, within its power, the optimum to reduce existing and forthcoming emissions in all ways possible. Those ways can be classified into three main categories:

- (1) Actions to sharply reduce emissions from existing sources
- (2) Actions to allay/prevent emissions from potential new sources
- (3) Actions to speedily replace existing emission sources with non- and/or less-polluting infrastructures/devices/policies.

Among the most important realistic targets/strategies of which I'm aware are:

Category (1):

- Fix gas leaks in distribution system
- Implement carbon emission fees and rebates
- Mandate increased energy efficiency, especially by utilities

Category (2):

- Reject all new gas pipelines and infrastructure

Category (3):

- Encourage if not insist upon the use of renewable energy wherever feasible

I urge DEP to do its utmost – as if in a war effort – to quickly implement policies and strategies that will ensure meeting the GWSA goals or better.

November 21, 2016

Commissioner Martin Suuberg  
Massachusetts Department of Environmental Protection  
MassDEP Headquarters  
1 Winter Street  
Boston, MA 02108

**RE: Informal Comments on Massachusetts Proposed Clean Energy Standard and Regulations to Reduce GHG Emissions from Electricity Generating Facilities Program**

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Dear Commissioner Suuberg,

Brookfield Renewable Partners (Brookfield) submits these comments in response to the request for informal comments made during the November 7<sup>th</sup> Stakeholder Meetings on establishing greenhouse gas (GHG) emission caps for electricity generating facilities and a Clean Energy Standard (CES). We appreciate the opportunity to comment.

Brookfield has a strong presence in New England, with over 1,200 MW of hydropower and storage, as well as almost 100 MW of wind assets, and a long track record of providing clean, renewable and reliable power. Brookfield also has readily available clean energy that can be imported to New England from our hydropower portfolios in New York and Quebec, representing 710 MW and 291 MW, respectively. In Massachusetts, our facilities include a 600 MW hydroelectric pumped storage facility (Bear Swamp) and a 10 MW hydroelectric facility (Fife Brook), plus our North American System Control Center located in Marlborough and U.S. headquarters in Boston.

Brookfield strongly supports the efforts being undertaken by Massachusetts to reduce GHGs from electricity generation and to promote clean electricity sources. The electricity market is undergoing a period of rapid change. Policymakers and stakeholders are increasingly demanding a more flexible and decarbonized 21<sup>st</sup> century grid, which will require a diversity of technologies and resources, including non-emitting baseload and dispatchable generation, renewables, advanced energy technologies and energy storage. Consumers and investors will be best served by electricity markets that provide strong transparent price signals to incentivize the adoption of new technologies, maintain and optimize the use of existing non-emitting generation and incorporate environmental objectives. A number of

organized markets are currently contemplating the importance of integrating environmental objectives into their markets, such as ISO-NE in the context of the Integrating Markets and Public Policy process.

Brookfield generally favors establishing robust carbon prices that are reflected in wholesale energy markets and believes that this results in the best policy outcome over the long-term, with the greatest level of clarity for operators and developers of electricity infrastructure. In this sense, placing emissions caps on fossil generators, as proposed, conceivably provides an important carbon price signal to the market. However this signal will be muted if the caps do not tie back to more aggressive state-level targets for GHG reductions, and if a broader carbon trading system is not in place beyond just the fossil sector. It is also notable that the Regional Greenhouse Gas Initiative also does not achieve this purpose since it does not clearly tie back to more aggressive state-level targets (which are often achieved indirectly through contracting or renewable portfolio policies) and therefore the full value of carbon is not reflected in electricity markets.

In the absence of a fully integrated carbon price in the energy markets, we believe that GHG emissions limits coupled with a properly designed, comprehensive CES will be crucial elements of achieving the Massachusetts Global Warming Solutions Act (GWSA) objectives in order to provide a clear and sustained long-term signal to support clean energy. In this context, Brookfield supports implementing a CES as soon as possible that recognizes the value of and provides comparable non-discriminatory treatment to all non-emitting resources, whether they are new or existing. This will also help ensure that the Commonwealth can access the most cost-effective non-emitting resources over the near-term, by recognizing their value under a transparent and predictable CES mechanism. Ideally implementation of a CES would be aligned with the launch of the forthcoming Massachusetts Request for Proposals (RFP) under the Act to Promote Energy Diversity, since it would clarify how clean resources such as hydropower will be valued for their carbon-free benefits.

### **Clean Energy Standard (CES)**

Brookfield has reviewed the discussion questions provided by Massachusetts DEP and provides the following responses.

*1. When should the CES take effect, and should the CES remain in effect until 2050?*

It will be important that the CES take effect as soon as possible to help achieve Massachusetts' ambitious emissions reductions goals. Ideally the CES should be in place in parallel with the Massachusetts clean energy RFP in order to transparently assess the value of these resources as non-emitting generation to meet the state's targets. This would ensure the most cost-effective outcomes for the Commonwealth as well as ensuring near-term access to clean energy resources that are under increasing demand.

As discussed during the stakeholder meeting, additional emissions reductions of at least 5.3% below 1990 levels are required between 2013 and 2020. Clean electricity resources have and will continue to make a significant contribution to realizing Massachusetts' 2020 objective; timely implementation of a CES will maximize their near-term contribution. Moreover, by implementing the CES as soon as possible, Massachusetts also guarantees first access to existing non-emitting resources that can contribute to further reducing its GHG emissions. Finally, to align with the GWSA target to reduce emissions by at least 80% by 2050, the CES should remain in effect until at least 2050 with an increasing percentage of load required from clean energy resources.

2. *What should the standard (expressed as a percent of electrical load) be for each year, or how should it be determined?*

The CES should contain mandatory targets that provide a credible path towards achieving 2020 and 2050 emissions reductions objectives. The CES should take effect as soon as possible with an increasing percentage of load required to be met from clean energy resources over time. Mandatory targets could be set for each year with adequate flexibility mechanisms, or a combination of mandatory targets and interim goals could be used. Under either scenario, it will be important that targets and goals be established well in advance to provide LSEs clarity and certainty with respect to their obligations and sufficient time for investments in and contracting of clean energy resources.

Specifically, Brookfield recommends that the CES require delivery of clean energy prior to 2020 beyond delivery required to comply with the RPS. Under the previous proposal<sup>1</sup>, the CES requirement was set equal to the RPS Class 1 requirement in the years 2015-2019, increasing to 30% plus the Class I requirement for the years 2020-2024. Introducing a higher requirement in earlier years together with the inclusion of all existing non-emitting resources would recognize that existing clean energy is available that is currently not counted under the RPS or GWSA targets. It would also allow for a more gradual transition to the 2020 requirement and beyond, and ensures that the Commonwealth can access near-term available resources most cost-effectively by having their value recognized in a transparent CES. CES eligibility is discussed in greater detail in the responses to questions 4 and 5 below.

3. *Should municipal light plants be required to comply?*

Brookfield supports the inclusion of municipal light plants (MLPs) in the CES. The CES should apply to all electrical load in Massachusetts to reduce the possibility of leakage from covered to uncovered suppliers, which would reduce the effectiveness of the standard.

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<sup>1</sup> 310 CMR 7.75: Clean Energy Standard, <http://www.mass.gov/eea/agencies/massdep/climate-energy/climate/ghg/ces.html>.

In the previously proposed CES, a different standard was proposed for MLPs due to the fact that they are not subject to the RPS program and therefore not currently required to deliver renewable energy that would count towards the CES. If it is once again determined that special treatment is required for MLPs, this treatment should be provided on a time-limited basis only and be structured to phase out as quickly as possible to avoid prolonged differences between the requirements applicable to MLPs and other suppliers. Specifically, the standard for MLPs should not be discounted indefinitely by the amount of the RPS standard for the year.

4. *Should eligibility for clean generators be based on a list of “clean” technologies, or on an emissions threshold? E.g., a percent cleaner than new combined cycle natural gas generation? How should the list of technologies or the emissions threshold be determined?*

Brookfield strongly recommends that CES eligibility should be defined to encompass all non-emitting generators. This approach would result in comparable non-discriminatory treatment of all generators that provide clean electricity to the grid. This is critical not only to optimize the use of this generation and maintain it to the benefit of the grid over the long-term, but also to ensure that the Commonwealth is able to access the full suite of clean energy resources under a transparent mechanism that values this non-emitting energy according to the state’s own GHG emission reduction targets.

Specifically, Brookfield does not support eligibility criteria that would exclude certain non-emitting generators on the basis of technology, size or vintage. Such criteria produce inefficient outcomes by incentivizing investments in certain resources over others despite the fact that they provide identical services (i.e., clean electricity), which increases the cost of achieving emissions reductions. For example, a CES that restricts support to resources constructed or entering commercial operation after a certain date will favour these resources over otherwise identical ones. The lack of comparable value recognition for existing resources may lead these resources to export out of the market or retire and may deter cost-effective imports, which would necessitate costly investments to replace existing non-emitting generation.

Further, Brookfield believes a CES limited to non-emitting resources is preferable to an emissions-based threshold. While we appreciate that a wide variety of resources can contribute to reducing emissions in the short-term, long-run achievement of emissions reductions targets will require transitioning to non-emitting resources. Moreover, non-emitting resources are already providing valuable services to the grid without compensation as traditional electricity markets do not recognize the additional value of their carbon-free generation. A fair CES could rectify this market failure. In contrast, emitting generators should not be similarly compensated as they do not provide the same environmental attributes and in fact impose a societal cost through their carbon emissions.

If it is determined that an emissions-based threshold should be adopted, this approach should only be used as a transitional measure. The emissions-based threshold should decline over time in recognition that electricity markets provide revenue sufficiency for emitting generators and emitting resources should only be partially eligible under the CES based on their performance relative to the threshold. For example, 10% of the generation from a resource should qualify as clean energy if the emissions of that resource are 10% below the emissions-based threshold.

5. *Should eligibility for clean generators be limited to “new” facilities? E.g., should existing hydroelectric generation be allowed for compliance? If so, what should be the cut-off for being considered new? What about transmission capacity for electricity imported into New England?*

Brookfield strongly recommends that CES eligibility encompass all non-emitting generators, including existing non-emitting generation. Brookfield does not support eligibility criteria that would exclude certain non-emitting resources on the basis of technology, size or vintage. Existing non-emitting resources such as hydropower provide substantial environmental benefits to New England and the region and their retention, and optimized use, will be necessary to maximize emissions reductions cost-effectively. Exclusion from the CES may lead existing non-emitting resources to export out of the market or retire, which would necessitate costly investments to replace existing non-emitting generation. The export or retirement of these assets would also result in the loss of the associated capacity and ancillary services benefits.

Critically, significant potential also exists to import existing non-emitting resources into the Commonwealth from within and outside of ISO-NE, which are currently not counted toward the Massachusetts carbon accounting baseline. The CES may therefore also deter cost-effective imports if it does not recognize the value of their non-emitting generation. This issue would be exacerbated if other restrictive conditions are imposed on import resources. For example, generators importing electricity into Massachusetts should not be obligated to use transmission capacity constructed after a certain date as was previously proposed. Rather, generators should be permitted to use a combination of existing and new transmission capacity reflecting the nature and location of their assets, and constraints on the transmission grid, as long as these resources contribute to Massachusetts’ clean energy and GWSA targets. Broadly defined and flexible eligibility criteria will ensure emissions reductions are achieved at least cost through a combination of new and existing resources, and cost-effective imports.

6. *Should the CES include flexibility options such as an alternative compliance payment?*

Brookfield Renewable recognizes that flexibility mechanisms, such as banking of Clean Energy Credits (CEC), may be required to achieve compliance and that in certain circumstances the supply of available CECs may still be insufficient to allow full compliance. As such, Brookfield does not oppose Alternative Compliance Payment (ACP) mechanisms if they are set at levels to sufficiently value the contribution of clean energy resources. Specifically, to ensure that Massachusetts

achieves its GWSA targets by attracting adequate clean energy resources, it is important that the ACP be set high enough to promote real investments in clean electricity over compliance payments. Moreover, any ACP should apply uniformly to all resources under the CES rather than a tiered structure, which would result in the inefficiencies and lost opportunities described above.

### **Greenhouse Gas Emissions from Electricity Generating Facilities Program**

In the absence of a broad-based price on carbon that fully reflects its value to the electricity sector (if not the broader economy), imposing limits on emissions from fossil-fuel fired generators together with the proposed CES can serve as an important initial step in Massachusetts' commitment towards achieving its 2020 and 2050 goals under the GWSA and providing a long-term signal to support clean energy. However, significant caution will be required to ensure cost-effective emissions reductions and avoid introducing perverse incentives and market distortions.

Massachusetts DEP has proposed a system of facility-specific emissions caps combined with banking and trading of over compliance credits (OCCs). Emitting generators will be required to reduce emissions below their respective caps or purchase OCCs from generators that outperform their requirements. While this approach will reduce emissions, it may lead to higher long-run costs relative to a broad-based carbon price, as the price of OCCs will not necessarily reflect the least cost method of emissions abatement. Moreover, OCC prices may not reflect the societal cost imposed by emitting generators. As a result, the proposed approach will provide weaker incentives to existing and new clean energy resources and cost-effective imports that are required to achieve emissions reductions objectives. It will be particularly important that the CES provide comparable non-discriminatory treatment to all generators that provide clean electricity to the grid under this scenario.

Brookfield is pleased to discuss the comments provided herein and looks forward to future opportunities to comment on these initiatives. Thank you for the opportunity to comment.

Sincerely,

Jon Norman  
Vice President, Government Affairs & Policy  
Phone: 647-283-6993  
[Jonathan.Norman@brookfieldrenewable.com](mailto:Jonathan.Norman@brookfieldrenewable.com)





November 21, 2016

Jordan Garfinkle  
Environmental Analyst  
Massachusetts Department of Environmental Protection  
1 Winter Street  
Boston, Massachusetts 02108

Re: 310 CMR 7.77, Reducing Greenhouse Gas Emissions from Electricity Generating Facilities Program

Dear Mr. Garfinkle:

We appreciate the opportunity to comment on 310 CMR 7.77, Reducing Greenhouse Gas Emissions from Electricity Generating Facilities Program. We support the draft regulation and the decisions to regulate sources under EPA's 40 CFR 98.40.

Wheelabrator Technologies is an industry leader in the safe and environmentally sound conversion of municipal solid waste (MSW) — and other renewable waste fuels — into clean energy. Wheelabrator pioneered the waste-to-energy (WTE) industry in the U.S. when it designed, built and operated the first commercially successful facility in 1975. We have three waste-to-energy facilities in Massachusetts.

Recognition of WTE as a source of GHG mitigation and inclusion of WTE as an eligible source of carbon offsets follows the long established recognition of the Intergovernmental Panel on Climate Change, Kyoto Protocol, the US EPA, the California Department of Resources Recycling and Recovery and the European Union.

As you know, WTE is not capped by the Regional Greenhouse Gas Initiative (RGGI). WTE is also not capped by the European Union Emission Trading Scheme, Kyoto Protocol's Clean Development Mechanism, the Verified Carbon Standard, US EPA's Clean Power Plan or the Québec cap and trade programs. WTE generates carbon offset credits under the Kyoto Protocol's Clean Development Mechanism, the Verified Carbon Standard and the US EPA's Clean Power Plan.

Our WTE facilities provide safe post-recycled MSW disposal for communities where we operate. These facilities deliver clean, energy to major utilities for distribution to hundreds of thousands of homes and businesses. Wheelabrator facilities contribute to the economic and civic vitality of their host communities.

We look forward to continuing to work together with the Commonwealth to reduce greenhouse gas emissions.

Sincerely,

A handwritten signature in blue ink, appearing to read "mFO", is placed above the printed name.

Michael O'Friel  
Senior Vice President & General Counsel  
Wheelabrator Technologies Inc.





November 16, 2016

Massachusetts Department of Environmental Protection  
One Winter Street  
Boston, Massachusetts 02108

RE: Comments on Regulations to Reduce GHG Emissions under Section 3(d) of the Global Warming Solutions Act (GWSA)

To Whom It May Concern:

The American Carbon Registry (ACR) respectfully submits comments herein to contribute to the development of regulations to ensure Massachusetts complies with Section 3(d) of the state's Global Warming Solutions Act (GWSA). Founded in 1996 as the first private voluntary greenhouse gas registry in the world, ACR has twenty years of unparalleled experience in the development of rigorous, science-based carbon offset standards and methodologies, as well as operational experience in project registration, verification oversight, and credit issuance. ACR is a pioneer in harnessing the power of markets to realize emissions reductions without burdening the economy. ACR's parent organization, Winrock International, is named for philanthropist Winthrop Rockefeller and is a nonprofit organization that works with people in the United States and around the world to empower the disadvantaged, increase economic opportunity, and sustain natural resources. Winrock staff have been deeply involved in development of robust carbon accounting methodologies, as well as design of carbon offsetting systems, and this expertise fortifies ACR's ability to ensure the integrity of every offset issued.

ACR is also an approved Offset Project Registry (OPR) for the California cap-and-trade program. In this role, ACR works with the California Air Resources Board (ARB) to oversee the registration and issuance of California-eligible offsets. In addition, ACR was recently approved in Washington State to issue compliance offsets for nine ACR offset project types. We appreciate the pioneering role Massachusetts has played in advancing climate action, particularly through RGGI, the country's first large-scale program to leverage the efficiency of markets to reduce greenhouse gas (GHG) emissions.

Pivotal to the challenge Massachusetts now faces is the requirement to impose absolute and declining in-state limits on GHGs. The Supreme Judicial Court could not have been clearer, in its May 2016 ruling, that the "aggregate" caps required in Section 3(d) of the Global Warming Solutions Act (GWSA) must be volumetric – not rate-based. The DEP must "ensure" compliance with the mandated reductions. Any plans, however ambitious, however fortified with fallback measures, fall short if they fail to guarantee that the State realizes the reductions required by statute.

As important as it is to fulfill this legal obligation, paramount is the moral obligation to address climate change with unwavering resolve. The "anthropocene" period we've entered is already manifesting both globally and locally, in Massachusetts. Heat records are broken with regularity; an unstable polar vortex creates dangerously frigid conditions; and unprecedented snowfalls hamper comfort, productivity, and safety. Although scientists caution against attributing individual weather events to elevated GHG

concentrations, the trends are undoubtedly consistent with predictions of a changing climate. Anything less than hard and fast limits on GHG emissions would be a failure to acknowledge not only scientific evidence but, increasingly, the lived experience.

In the face of this stark reality, ACR finds encouragement in the approach DEP contemplates for electricity generators. This baseline-and-crediting approach provides certainty that the covered emitters will stay within their GHG limit, while employing market efficiency to alleviate costs. **DEP should extend this approach beyond electricity generation to encompass emissions from transportation fuels, gas-insulated switchgear, and natural gas distribution. Covering all these sources under a unified, market-based program will be most cost effective.** A more expansive cap, by definition, offers a greater number of emissions reduction opportunities and can, therefore, provide more low cost GHG mitigation potential. An efficient market would capitalize on least-cost solutions to the benefit of Massachusetts drivers and rate payers.

Furthermore, the approach DEP has proposed places solely on the power generation sector the responsibility for ensuring the state's overall emissions stay within mandated limits. Aside from questions of fairness, a single cap over electricity generation, transportation fuels, and other sources provides far greater assurance that the emissions do not exceed the overall limit. The bifurcated approach DEP is considering relies on estimates of future emissions outside of power generation. If actual uncapped emissions turn out higher than expected, power sector emissions reductions may be insufficient to make up for the exceedance. Far better is to minimize dependence on forecasts. Putting power generation, transportation fuels, and other sources under a single cap would likely still result in emissions reductions being concentrated in the power sector, especially in the near term, given cost and time requirements for emissions reductions in transportation versus electricity sectors. However, a unified cap would greatly enhance certainty that overall targets will be achieved.

As a practical consideration, the primary point of regulation for transportation fuels can be “at the rack.” It may be helpful to refer to the California cap-and-trade regulation.<sup>1</sup> Section 95982(d) delineates suppliers of petroleum products. Among useful definitions in the regulation are those for Supplier of RBOB and Distillate Fuel Oil, Position Holder, Enterer, Terminal, and Rack.

To further strengthen the state's ability to comply with GHG limits and to do so at minimal cost, **DEP should allow regulated entities to use Alternative Compliance Mechanisms, as outlined in the GWSA.** These emissions reductions are commonly known as “offsets” or “offset credits.” Registries such as ACR already issue offsets that comport with Massachusetts' statutory requirement that such reductions be “real, permanent, quantifiable, verifiable, and enforceable.”

Washington State's climate rule parallels the baseline-and-crediting approach DEP is considering for electricity generators, except that Washington regulators have incorporated offsets.<sup>2</sup> While offsets must be generated in-state and in accordance with approved methodologies, Washington regulators allowed unlimited offsets usage due to concern about limited emissions reduction potential within the transportation sector. To reduce administrative burden, the Washington program makes use of outside registries. ACR, for example, is responsible for overseeing offset project registration and independent verification by an accredited entity and issuing offsets in accordance with the nine ACR offset project

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<sup>1</sup> [https://www.arb.ca.gov/cc/capandtrade/capandtrade/unofficial\\_ct\\_030116.pdf](https://www.arb.ca.gov/cc/capandtrade/capandtrade/unofficial_ct_030116.pdf)

<sup>2</sup> <http://www.ecy.wa.gov/laws-rules/WAC173442/X1510a.pdf>

methodologies approved in the rule. The offset credits issued in accordance with the regulation are eligible for use by compliance entities towards their emissions reduction obligation. This technical and procedural oversight provided by ACR occurs at no cost to the state and even saves the state the need to hire and staff an offset department to play the same role. All trading of offsets occurs on the registry between registry account holders. Washington regulators do not administer a system that facilitates trading of offsets. If an entity chooses to use offsets for compliance, its compliance report must include details about the offsets, along with evidence of their retirement.

To increase offsets potential, as well as accommodate new and updated offsets methodologies, DEP may wish to simply approve third-party registries against set criteria and then generally accept offsets issued by those registries. Offsets could still be subject to limitations, such as location, year of issuance, and sector, but the overall approach would be less rigid than that of designating specific methodologies as reflected in the Washington rule.

Please note that, if DEP must specify that Alternative Compliance Mechanisms reflect actions undertaken in the same year as reported emissions, compliance deadlines will need to allow sufficient time for offsets verification and issuance. For fluorinated gas projects, verification and offset credit issuance could take nine months, and some agriculture or land use projects may require 18 months. Deadlines for compliance reports, or for reporting of Alternative Compliance Mechanisms, would therefore need to be sufficiently later than the end of the compliance year. However, it would be preferable that Alternative Compliance Mechanisms need not reflect emissions reductions occurring in the same year as the compliance year. This flexibility would alleviate pressure on the verification cycle, without materially diminishing environmental integrity.

As a broad point, we would like to highlight the value offsets add to climate programs. Offsets provide cost containment and emissions abatement, along with economic and environmental co-benefits. Offsets provide means to reach out-of-scope sources and sinks, in so doing delivering economic opportunities for other sectors and communities. Furthermore, offsets can cost effectively target short-lived climate pollutants, such as fluorinated gases and methane. The near-term warming effect of these pollutants is magnified, meaning that their mitigation buys critical time for the transition to a cleaner economy.

ACR's published methodologies include the following<sup>3</sup>:

- Transition to Advanced Formulation Blowing Agents in Foam Manufacturing and Use
- Use of Certified Reclaimed HFC Refrigerants and Advanced Refrigeration Systems
- Recycling of Transformer Oil
- Fertilizer Management
- Grazing Land and Livestock Management
- Compost Additions to Grazed Grasslands
- Wetland Restoration

In addition, other methodologies are in various stages of development, including the following:

- Destruction of Ozone Depleting Substances and High-GWP Foam (update to ARB protocol)

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<sup>3</sup> For a complete list of ACR methodologies, please see <http://americancarbonregistry.org/carbon-accounting/standards-methodologies>.

- Landfill Gas Destruction and Beneficial Use Projects

Among the methodologies with the strongest potential for substantial emissions reductions within short project timeframes are those associated with fluorinated gases: transition to low-GWP blowing agents, HFC reclamation and advanced refrigeration, and destruction of ozone depleting substances and high-GWP foam. These approaches to GHG mitigation could meaningfully support Massachusetts’ ability to comply with the impending 2020 limit.

Massachusetts’ emissions inventory indicates that annual HFC releases amount to over 3.3 million tons CO<sub>2</sub>e. ACR’s methodologies offer a multipronged approach to this large and growing problem – the collective climate warming impact of HFCs in the state is already about a third that of all the fossil fueled power plants. By allowing offsets that incentivize HFC reclamation, upgrades to refrigeration systems, and transitions to low-GWP blowing agents, all major uses of HFCs can be addressed. Upgrades to refrigeration systems would, of course, also reduce emissions from energy consumption. Economic benefits would be widely distributed. Some 50 identified entities using high-GWP blowing agents could see new revenue streams. They include construction companies using spray foam for insulation; refrigerated transport providers; and manufacturers of foam, HVAC systems, boats, insulation, industrial doors, and industrial refrigeration systems. Of the 600 supermarkets across the state, none currently hold the EPA Greenchill program’s “platinum” certification, for which a store with an advanced refrigeration system would qualify. Refrigerant usage for all applications (stationary and mobile air conditioning, and household, commercial, and industrial refrigeration) offers opportunities to reclaim HFCs. Extrapolating from data<sup>4</sup> on California refrigerant use, emissions, and recovery volumes, the technical potential for avoided climate impact through recovery and reclamation of HFC refrigerants sourced in Massachusetts is estimated as follows<sup>5</sup>:

Year	Potential climate benefit of HFC reclamation in MA (metric tons CO <sub>2</sub> e)
2017	450,000
2018	472,000
2019	511,000
2020	552,000
2021	924,000
2022	706,000
2023	721,000
2024	735,000
2025	600,000

ACR’s methodology for destruction of ozone depleting substances and high-GWP foam, currently in scientific peer review, addresses global warming pollutants not explicitly recognized as GHGs under the GWSA. However, the GWSA’s GHG definition clearly allows DEP to cover more than those gases specified, as GHG’s are defined as “any chemical or physical substance that is emitted into the air and that the department may reasonably anticipate will cause or contribute to climate change including, *but*

<sup>4</sup> CARB (2008) Inventory of Direct and Indirect GHG Emissions from Stationary Air Conditioning and Refrigeration. ARMINES, Centre Energétique et Procédés for CARB, June, 2008

<sup>5</sup> Analysis by EOS Climate, which originated the ACR Methodology.

*not limited to,”* the specified gases (emphasis added). Various fluorinated gases unnamed in the GHG definition pose great harm – CFC-12, as an example, has a global warming potential 10,900 that of CO<sub>2</sub>. DEP should allow the destruction of these potent GHGs, when sourced from Massachusetts, to contribute to meeting the mandated GHG limits.


Several other methodologies could also see application in Massachusetts, while offering material co-benefits. Among the examples:

- As DEP has recognized, water use goals are being impaired by nutrient run-off. Improved fertilizer application, while reducing GHG emissions, could result in improvements to public water supply, recreational opportunities, and protection of aquatic life.
- Dairy farmers could see new offset revenue by changing grazing, manure management, and feed practices, resulting in better soil health and air quality. Engaging the agriculture sector in climate mitigation efforts can be challenging, and such offsets can help effect participation. Note that ACR’s Grazing Land and Livestock Management methodology is adaptable to smaller operations that may be common in Massachusetts.
- While Massachusetts has seen much progress in reducing methane emissions from landfills, the 350,000 metric tons CO<sub>2</sub>e still released may have potential for further mitigation. ACR’s new methodology for landfill gas is currently in scientific peer review.
- Wetlands in Massachusetts could be restored to provide a buffer against storm surges and flooding, protecting infrastructure investments and enhancing habitat, soil, and water quality, in addition to reducing GHG emissions. A wetlands methodology could potentially be developed for use in Massachusetts.
- As the eighth most densely forested state, Massachusetts presents potential opportunities to increase carbon stocks, despite fragmented land ownership. Indeed, two Massachusetts forestland owners have initiated the process to generate California-eligible offsets through improved forest management. DEP has the opportunity to enhance forest carbon sequestration in its own state.

By extending DEP’s proposed approach for electricity generation to transportation fuels and other GHG sources, the citizens of Massachusetts will benefit from greater market efficiency and increased certainty of climate protection. Offsets will further decrease costs, while providing additional economic and environmental benefits.

We appreciate the opportunity to contribute to development of the Massachusetts’ regulation to comply with the GWSA. Please feel free to contact us if you would like to further discuss our comments.

Respectfully,



Arjun Patney  
Policy Director, American Carbon Registry  
an enterprise of Winrock International  
arjun.patney@winrock.org



November 21, 2016

Commissioner Martin Suuberg  
MassDEP  
One Winter Street  
Boston, MA 02108

[Climate.strategies@state.ma.us](mailto:Climate.strategies@state.ma.us)

Re: Section 3(d) and GWSA Comments

Dear Commissioner Suuberg:

Without imposing new regulations on industry outside of the electricity sector, DEP, working in conjunction with DOER in the Next Generation Solar and Energy Storage initiatives, could meet the 2020 goals by substantially increasing the development of solar generation within the Commonwealth beyond the 1,600 MW currently envisioned to a percentage of total electricity consumed by Massachusetts.

Solar is the fastest deliverable, measureable, zero emitting resource that is capable of reaching all industry sectors through full retail net metering and through the utility based tariff program envisioned by DOER. Net metering encourages specific consumers to engage in solar.

In setting standards, DEP should stipulate, and thereby giving notice to the market, that Commonwealth based solar generation will be designated for 25% of Massachusetts's generation needs by 2030. Similar stated goals should be established for wind and other renewable generation sources. Transition to renewable generation goals should be stated.

The SJC decision calls for greenhouse gas reductions to occur within the Commonwealth and solar generation built within Massachusetts meets those objectives. Creating an energy economy and retaining and recirculating our energy dollars within the Commonwealth should be paramount as we transition to renewables and replace the 10 MW of retiring fossil fuel generators scheduled to retire by 2020.

Raising the RPS to 2-2.5% and increasing the requirements over time will be required. There is growing evidence the world is not moving fast enough in the reduction of greenhouse gases.

DEP should consider pivoting off of the solar, energy storage and commercial PACE initiatives to segue to clean transportation, clean energy sources and net zero energy building outlined in the DEP, 2015 Update of the Clean Energy and Climate Plan for 2020.

We appreciate the opportunity to comment on this regulatory process.

Best Regards,

A handwritten signature in blue ink, appearing to read "Doug Pope", written over a horizontal line.

Doug Pope  
President

From: Margaret Pricejones

Sent: Wednesday, November 2, 2016 8:38:50 AM (UTC-05:00) Eastern Time (US & Canada)

To: Strategies, Climate (DEP)

Subject: GHG Section 3d Comments

As a mother and a citizen of the world, I ask you to require utility companies to fix gas leaks that are emitting the greatest amount. According to their current system, the utility companies only repair the leaks that are at risk of being explosive. There are leaks that may not be at this risk level, and yet they are leaking massive amounts of methane into the air. Methane contributes more to climate change than carbon dioxide. Please hold utility companies accountable. I am a member of the Mothers Out Front organization. We are working to influence federal, state, and local decision makers to move away from fossil fuels to renewable energy sources.

Thank you for your attention to this very important issue.

**From:** Mike Prokosch

**Sent:** Wednesday, November 16, 2016 5:48:49 PM (UTC-05:00) Eastern Time (US & Canada)

**To:** Strategies, Climate (DEP)

**Subject:** Comments for Department of Environmental Protection Hearing on Executive Order 569

Boston Climate Action Network wishes to submit the following comments on DEP's proposed regulation on measuring methane emissions from leaks in natural gas pipelines. BostonCAN has been working to repair gas leaks for several years; has testified at DPU hearings on gas leaks; and has urged state and city elected officials to take faster action on methane emissions, which constitute over a third of Boston's greenhouse gas footprint and over a tenth of the state's.

1. The emissions factor that the DEP proposes to use is inadequate. A 2014 BU-Harvard study of overall industrial methane levels in greater Boston found levels more than twice those in utility and government estimates.

Utility data, the basis for the proposed factor, are unreliable. The proposed factor, which is based on data from across the country, may well underestimate emissions from Boston's very old, deteriorating distribution system. (See attached letter from Dr. Margaret Cherne-Hendrick, Dr. Nathan Phillips, and Dr. Lucy Hutyra of Boston University.)

2. We need an accurate baseline of current methane emissions in order to schedule reductions year over year. That baseline must be based on actual field measurements of emissions. Those bottom-up measurements should be checked against top-down measurements of atmospheric methane levels as in the BU-Harvard study.

3. The field measurements must be independently verified, especially if they are provided by gas utility companies.

Respectfully submitted,

Mike Prokosch

Boston Climate Action Network





PO Box 383  
Madison, CT 06443  
Voice: 646-734-8768  
Email: [fpullaro@renew-ne.org](mailto:fpullaro@renew-ne.org)  
Web: [renew-ne.org](http://renew-ne.org)

November 21, 2016

Via [climate.strategies@state.ma.us](mailto:climate.strategies@state.ma.us)

Jordan Garfinkle  
Massachusetts Department of Environmental Protection  
One Winter St.  
Boston, MA 02108

**Subject: Comments on GWSA Regulations – Retail Electricity Sellers**

Mr. Garfinkle:

Following the November 7, 2016, Massachusetts Department of Environmental Protection (“MassDEP”) stakeholder meeting on development of Global Warming Solutions Act (GWSA”) regulations, RENEW submits these comments to offer recommendations for how the electric power sector should contribute to meeting the statewide emissions limit mandated by the GWSA.<sup>1</sup> First, RENEW commends Governor Baker for his continued commitment to the development of clean energy and other programs to meet the Commonwealth’s carbon reduction mandates.

RENEW recommends Massachusetts adopt an explicit “**renewables first**” strategy that, upon the regulations taking effect and in conjunction with setting limits on existing power generators, increases the annual growth rate for Class I of the Renewable Portfolio Standard (“RPS”) by an amount necessary to achieve the carbon reduction goals for the electric power sector. According to a report prepared for New England’s governors, the region has over 10,000 MW combined of on-shore and off-shore wind power potential, as well as other low-carbon resources.

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<sup>1</sup> The comments expressed herein represent the views of RENEW and not necessarily those of any particular member of RENEW.

Ensuring compliance with increased RPS requirements is possible through planned clean energy procurements under Massachusetts' new clean energy procurement law, the Energy Diversity Act,<sup>2</sup> and electric transmission upgrades being considered by the New England States, to bring clean and sustainable energy resources, like wind, solar and hydropower, to consumers. MassDEP should set interim GHG requirements between 2020 and 2050 and require procurements of Class I renewable energy be conducted to keep pace with declining statewide emissions limits. Utilizing and expanding existing programs offers Massachusetts a ready-made and proven approach to reduce carbon emissions on the scale and time needed to achieve the objectives of the GWSA.

Previously approved contracts with onshore wind developers are providing renewable energy at prices that compare favorably to the projected market prices of power and renewable energy certificates. Strengthening the RPS will also give Massachusetts an opportunity to concentrate on advancing the next generation of renewables like offshore wind in the waters off the South Coast. The U.S. Department of Energy has estimated that by the year 2030 there will be 43,000 offshore wind related jobs on the East Coast alone. The states that go first in establishing this new growth industry will capture the largest amount of this market share. A pipeline of offshore wind projects in the billions of dollars will emerge and thousands of jobs will be created over the next decade across the Commonwealth. Offshore wind procurements under the Energy Diversity Act are required to be conducted at several intervals over the next decade and can help keep pace with tightening limits on emissions. This design will, over the next decade, also ensure that a vast amount of new, carbon-free resources will become operational just before a significant amount of carbon-free resources like nuclear power plants near the end of their useful lives and retire.

A broader renewable energy strategy also enables Massachusetts to focus on the continued economic development benefits of existing small-scale renewable resources like hydropower and solar which provide renewable energy and economic development for all communities in the Commonwealth. Massachusetts solar programs have been a huge success with early goals achieved ahead of schedule. Small hydropower facilities, though, have many of the same operations and maintenance costs as larger renewable energy facilities but with lower output to spread across the cost. While the RPS Class II provides ways to offset these costs, it only covers projects up to 7.5 MWs. RENEW recommends raising the cap on eligible Class II small hydropower to 30 MW thereby aligning it with the Massachusetts Class I definition and that of many other states.

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<sup>2</sup> Mass. Ch. 188 of Acts of 2016.

RENEW appreciates the opportunity to offer these comments on policies that will ensure compliance with Massachusetts' GWSA. RENEW will continue to advocate for ways to lower the cost of renewable energy, decrease the region's dependence on fossil fuels and ensure a significant role for renewable energy resources that will boost the Commonwealth's economy.

Sincerely,

A handwritten signature in blue ink that reads "Francis E. Pullaro". The signature is written in a cursive, flowing style.

Francis Pullaro  
Executive Director



1 Beacon Street, 16th Floor  
Boston, MA 02108

[www.aimnet.org](http://www.aimnet.org) | 617.262.1180 | fax 617.536.6785

**BY EMAIL TO [climate.strategies@state.ma.us](mailto:climate.strategies@state.ma.us)**

November 21, 2016

Jordan Garfinkle  
Massachusetts Department of Environmental Protection  
One Winter Street  
Boston, MA 02108

Re: Comments to DEP Proposed GWSA Regulations – Emitting Electricity Generators and Retail Electricity Sellers

Dear Mr. Garfinkle:

Associated Industries of Massachusetts (AIM) is pleased to provide the following comments to DEP's Proposed GWSA Regulations – Emitting Electricity Generators and Retail Electricity Suppliers. AIM's mission is to promote the prosperity of the Commonwealth of Massachusetts by improving the economic climate, proactively advocating fair and equitable public policy, and providing relevant, reliable information and excellent services.

The proposed rule outlines compliance mechanisms needed to comply with section 3(d) of the Global Warming Solutions Act ("GWSA") as interpreted by the recent Supreme Judicial Court decision in *Kain vs. Department of Environmental Protection* ("DEP") ("*Kain*") as well as overall economy-wide greenhouse gas ("GHG") reductions required under the GWSA. Two compliance mechanisms were outlined: an in-state cap with annual reductions of GHG emissions from the electricity generation sector and a clean energy standard ("CES") for retail electricity suppliers.

AIM believes that the proposed regulations requiring an in-state cap on GHG emissions along with annual GHG emission reductions from the electricity generation sector results from an unnecessarily aggressive reading of *Kain* and further, the proposed clean energy standard for retail electricity suppliers is unnecessary given the recent signing of the omnibus energy bill - *An Act Relative to Energy Diversity* ("energy bill"). These proposed regulations will raise electricity prices and will likely shift electricity production and GHG emissions to other New England states in order to account for shortfalls in electricity generation in Massachusetts. Not only is this unfair to other states, it is inconsistent with a regional energy approach and recent cooperative efforts among the New England states and will not reduce GHG emissions overall.

We further believe that the requirements of *Kain* and the goals of the GWSA can be met with regulations that are far more cost-effective and less disruptive to the electricity generation sector and retail electricity suppliers. Alternatively, DEP and the Administration could meet with legislative leaders to adopt minor clarifications to Section 3(d) of the GWSA to avoid what are likely to be significant economic and electricity reliability issues.

**DUE TO OUR HIGH ELECTRIC RATES, DEP'S PRIORITY SHOULD BE TO COMPLY WITH *KAIN* AND THE GWSA AT THE LOWEST POSSIBLE COST TO RATEPAYERS**

Electricity rates in Massachusetts are among the highest in the nation. And to be frank, low wholesale prices for energy (due to the increased use of currently low-priced natural gas) have masked increases in overall electricity costs from permanent increases in other areas of customer's bills. These include a doubling of transmission rates since 2008, large increases in capacity costs, increases in distribution rates due to recent utility rate hikes, and increasing costs of mandated clean energy requirements, including programs related to subsidizing solar energy and other renewables, and to purchase carbon credits.

In 2015, nearly *1 billion dollars* in additional ratepayer costs resulted from just three programs - solar, other renewables and the purchase of carbon credits. All are growing, and some like solar are growing substantially. Should gas prices rise, as they are likely to do over the next decade due to inadequate natural gas infrastructure (despite the procurement of additional clean energy sources), these embedded costs will serve to magnify any wholesale electricity price increases. These non-energy increases do not even include costs for more clean energy power purchase agreements ("PPAs") contained in the recent energy bill. All of this has made electricity costs in Massachusetts unsustainable.

As a result DEP has an obligation to identify the economic impact of these proposals on customers' electric bills and has the further burden to justify these costs compared to other proposals that can meet the requirements of *Kain* and the GWSA but that are more cost-effective, including clarifying the law.

***KAIN* DOES NOT REQUIRE THE LEVEL OF EMISSION REDUCTIONS PROPOSED AND SUCH REDUCTIONS ARE NOT NECESSARY TO ACHIEVE THE GOALS OF THE GWSA**

AIM fully understands that the genesis for the in-state cap on GHG emissions along with annual GHG emission reductions from the electricity generation sector was the *Kain* decision which interpreted section 3(d) of the GWSA to require such action.

However, while *Kain* may require such action for the in-state electricity generation sector, it does not identify the actual cap amount nor does it stipulate the annual reduction requirements as long as the goals of the GWSA are met – and these goals include reductions from other sectors of the economy besides the electricity generation sector.

Further, Section 3(c) of the GWSA allows GHG emission reductions from out-of-state electricity generation to count towards compliance with the GWSA if such entities are serving Massachusetts load. With the recent energy bill, expectations are that nearly 40% of Massachusetts load will be served by non-carbon emitting sources. While these new clean energy sources are not guaranteed to reduce in-state electricity generation, they may. But either way, they will definitely result in the closure of carbon emission sources regionally.

This creates a conflict between the goals of *Kain* and the GWSA as such out-of-state reductions conform to Section 3(c) of the GWSA and allow Massachusetts to meet GHG reductions goals, but do not conform to *Kain*. Since *Kain* compliance is irrelevant to meeting our state's GWSA goals (because in fact, DEP did not propose a statewide cap and emission reduction as a GWSA compliance mechanism until *Kain* was decided) there is no specific need for aggressive in-state reductions from the electricity generation sector. Requirements already on the books will lead to further reductions in GWSA eligible emissions.

Additionally, required caps and reductions in the Massachusetts electricity generation sector are likely to have a diminishing impact on GHG emissions overall. The electricity generation sector has already reduced its emissions nearly 60%. Coal and oil are virtually nonexistent in the current mix of electricity generation (except, ironically, when there is not enough natural gas to serve regional load or make up shortfalls in renewable production). Therefore, at least for the near term natural gas will make up an increasing amount of the region's electricity generation mix (currently at about 60%), particularly if clean energy and offshore wind PPAs contemplated in the energy bill are delayed. Where once there was an ability to shift to cleaner burning natural gas from coal or oil to reduce emissions that option is no longer available since those fuel sources no longer exist. Restricting emissions from the electricity generators at this point means that plants do not run.

DEP should therefore establish the highest cap possible and the lowest in-state emission reductions possible to comply with *Kain* with the expectation that out-of-state emission reductions will be a significant contributor to GWSA compliance, an opinion held by DEP up until the *Kain* decision.

### **THE PROPOSED REGULATIONS WILL NOT RESULT IN LOWER GREENHOUSE GAS EMISSIONS AND MAY BE UNFAIR TO OTHER STATES**

It is without question that the electricity generation sector will produce enough power to serve load. As stated above, at least for the short term that load will be met by natural gas, though in the longer term clean energy imports may reduce the need for natural gas generation. Massachusetts regulators cannot tell consumers that there is not enough electricity to serve their load due to *Kain* or the GWSA.

What happens if in-state power plants cannot run due to the proposed regulations?

Simple. Out of state electrical generation will produce more to serve Massachusetts or regional load and make up for in-state shortfall. That is the way a regional energy grid works. This scenario will certainly allow Massachusetts to comply with *Kain* as it will reduce GHG from Massachusetts electricity generation, but this action will raise GHG emissions in neighboring states which will be "charged" to our GHG emission goal under the load profile calculations used to determine electricity sector compliance with the GWSA.

Of course, if every state adopted regulations similar to those proposed to comply with *Kain* that would be a problem or in the alternative if a neighboring state needed load from Massachusetts it would be unavailable. Further, while in-state reductions may work if electric load is stable or declining, that in fact may not be the case forever. There is no doubt energy efficiency and behind the meter generation are lowering load, but that may be temporary as electrification of transportation sources and even space heating are used to help reduce GHG reductions in those other sectors. This could actually increase the need for electricity generation and conventional power plants, even if the clean energy contemplated in the recent energy bill is built on time.

As a result imposing such limits as proposed here without understanding its regional implications may not make the world (or even the region) a better place. DEP should make it clear and quantify that these rules will only artificially lower GHG emissions in order to claim victory with *Kain* without lowering them regionally.

## **A CLEAN ENERGY STANDARD IS UNNECESSARY AND WILL ONLY SERVE TO RAISE PRICES WITHOUT DELIVERING GHG REDUCTIONS**

It is puzzling why DEP is proposing a new Clean Energy Standard just months after a major energy bill was signed by the Governor. If DEP desired a clean energy standard, they could have worked with stakeholders to include language to establish one during negotiations over the energy bill and at the same time could have reformed and coordinated all the renewable energy (RPS eligible and non-eligible) programs in Massachusetts.

The Administration would have received AIM's support for such a measure and this was articulated in comments made by AIM. AIM has long supported a fair clean energy standard as we believe such a standard would result in more clean energy being delivered to Massachusetts consumers at a lower cost. But that support was and still is contingent upon relieving the ratepayer of all artificial mandates and requirements that have been added to electricity supplier requirements (in the form of increasing RPS) and utilities (in the form of increasing amounts of long-term contracts for RPS and non-RPS sources) over the years in a haphazard fashion. AIM supported setting a new balanced clean energy standard and allowing the marketplace to compete across renewable technologies (as well as behind the meter technologies, such as energy efficiency, storage, CHP, etc.) to meet it.

Instead of embracing such an opportunity, the Administration instead chose to support the well-worn path of prescribing long-term contracts and allowing certain technologies to overrule a system of market based solutions. Be that as it may, the debate is over – the law has been signed.

Now, even before the energy suppliers and utilities have had a chance to implement provisions of the law, DEP is proposing to layer another requirement on suppliers, requiring even more clean energy mandates. This despite the fact that after the energy bill is fully implemented, about 40-45% of the current energy consumption in Massachusetts will be from clean energy sources. This may, at current technologies, be all the clean energy that our grid can absorb without regional reliability issues.

It is of course easy to say that shutting down natural gas electricity generation or establishing more stringent clean energy standards will spur the building of clean energy projects to replace natural gas plants. We disagree. With the amount of solicitations required under the energy bill as large as it is, the fact of the matter is that no large hydro or offshore wind will be built without long-term contracts, which are capped in the energy bill. The likelihood that any significant additional clean energy will be brought to market outside of a power purchase agreement is zero. As a result, any clean energy standard in excess of expected required PPAs under the energy bill will raise prices through what will likely be very high alternative compliance payments, not even reducing GHG.

Additionally, under the current energy law, virtually all the "clean energy" attributes (RECs and any CES credits should they be adopted under this proposal) from PPAs are the property of the utilities and they may keep these attributes or sell them into the market. With virtually all the large RPS eligible and non-RPS eligible (but likely CES eligible) sources locked up for the next decades, attributes will not be readily available to suppliers or will be available only if the utilities decide they do not want them. Therefore, the only place to buy these attributes is from the utility – and they own them all with no obligation to sell.

Ironically, this was also an issue raised by AIM in our comments to the Administration during the development of the energy bill. Our opinion at that time was that allowing the utilities the option to keep

the RECs to serve basic service load or sell the RECs in the market would disadvantage some customers that don't buy power through basic service. We urged the legislature and the Administration to adopt language that would require the utilities to sell all power and attributes back to the market without the option of keeping any, and crediting or debiting customers as appropriate. Had this position been supported, any concern about the availability of RECs and potential CES attributes would have been avoided. Because it was not, no amount of regulations will make the CES a fair system.

In suggesting a CES so soon after the energy bill, DEP is adopting a tactic of continually moving the target faster than laws can be implemented. Adopting such a standard is probably as significant as the energy bill itself, yet such changes are being implemented on-the-fly rather than through an orderly legislative process with appropriate analysis.

In sum, in order to comply with *Kain*, DEP should adopt the highest in-state emissions cap possible with the lowest annual reductions possible. Such a result will not hamper the goals articulated in the GWSA. Additionally, DEP should not adopt any clean energy standard. Large quantities of clean energy are already expected to be purchased under existing rules and regulations emanating from the recently passed energy bill – it needs time to come to fruition. Adopting a new standard will only serve to raise electricity prices at a time Massachusetts ratepayers are already suffering and the resulting compliance mechanisms will likely divert an enormous amount of compliance time from DEP's other important duties.

Alternatively, the DEP and the Administration can fix these issues, particularly with respect to the electric generation sector. DEP and the Administration must meet with our legislative leaders and ask that the GWSA be clarified with respect to Section 3(d). The type of changes recommended in this proposal could have serious impacts on reliability, loss of jobs and tax revenue, gas supplies, regional cooperative effects, and cost to consumers, and worse, are not even effective in reducing greenhouse gases. We believe that if DEP and the Administration presented these concerns to the legislature and stakeholders along with alternative ideas, rational policies could be implemented.

We look forward to working with your office to adopt standards and practices which meet the goals of *Kain* and the GWSA but which do not negatively impact our electric system.

Should you have any questions please do not hesitate to contact me.

Sincerely yours,

A handwritten signature in black ink, appearing to read "Robert A. Rio". The signature is fluid and cursive, with the first name "Robert" being more prominent than the last name "Rio".

Robert A. Rio, Esq.  
Senior Vice President and Counsel  
Government Affairs



**Comments of Larry Rosenberg**  
**Department of Environmental Protection Stakeholder Meeting**  
**November 2, 2016**  
**[larry.rosenberg@gmail.com](mailto:larry.rosenberg@gmail.com)**

Re: Reducing GHG Emissions under Section 3(d) of the  
Global Warming Solutions Act (GWSA)

My name is Larry Rosenberg. I was a researcher at the Harvard School of Public Health for many years until my recent retirement. I am now active with 350 Massachusetts.

Like many people here today, I am glad the SJC has made it clear that the Commonwealth must comply with the mandates of the GWSA. The global average temperature is likely higher than it has been in several thousand years, and the International Energy Agency says that current policies will lead to a six degree Celsius increase in temperature. They write that “[T]his will have catastrophic implications for all of us.” “On planned policies,” the agency reports, “rising fossil energy use will lead to irreversible and potentially catastrophic climate change.” Very similar highly alarming conclusions have been reached by the American Association for the Advancement of Science, NASA, the National Oceanic and Atmospheric Administration, the National Research Council, and the Bulletin of the Atomic Scientists, all of which I cited in my testimony at the DPU in March. I hope and trust that the DEP agrees that there is absolutely no more time to waste.

Today, we are focusing on what the DEP can and must do to ensure that the Commonwealth takes the necessary actions to comply with the GWSA. Here is what I think the DEP should do:

First, the DEP should identify the specific steps that it proposes for achieving reductions in greenhouse gas emissions and the quantity of emissions reduction that it is expecting from each step. We need to have a public airing of the relevant data and your analysis. Closely related to this, of course, is a clearly stated explanation about how the margin of error in your estimates is taken into account. In particular, we need to make sure that the worst case outcome in your projections will still leave us compliant with the GWSA.

Second, the DEP should strengthen currently existing energy efficiency programs. As good as they are, such programs, if expanded, could be a relatively low-cost method to achieve significant reductions in emissions.

Third, the DEP could turn some of its attention to municipal lighting plants, which are not included in energy efficiency programs or the Renewable Portfolio Standards. Some of these plants are performing quite well on these counts, but others are not. I think you could require that they meet the same standards as commercial power plants.

Fourth, I’m sure the DEP will get pushback from power generators, against which you will need to stand firm. The generators will point to the reductions they have already

achieved and say that you should look to the transportation sector, to buildings, and to commercial and industrial operations for future reductions. All of those are indeed sectors that need attention and major improvements in how they operate. But the GWSA requirements are statewide, not sector-wide. And I think there are few options for meaningful reductions in the next three years that don't include action in the electric power sector.

Fifth, the DEP may need to resist arguments that the steps it proposes will increase electricity bills. The GWSA and the SJC decision do not call for conditioning new measures on saving costs. I therefore don't think that the DEP can legitimately look at cost as an impediment to reaching the GWSA targets.

Sixth, the DEP must do everything in its power to stop any new fossil fuel infrastructure from being built. This means no new gas plants (for example in Medway and Sandwich), no new pipelines, and no new compressor stations. We cannot give in to the alleged need for more natural gas, when every step we take in that direction would make us more dependent on the extraction and burning that are bringing us to the risk of civilizational collapse.

Finally, at this late date, the DEP needs to focus on solutions and on overcoming all the technical, economic, and legal impediments that stand in the way of greatly reducing greenhouse gas emissions. These impediments can and must be overcome. Regarding such solutions, the DEP should support the following: a near-term boost in offshore wind, beyond what the legislature has already called for; greater incentives for solar energy and elimination of the impediments to expanding the solar industry; strengthening of both energy efficiency and demand response programs; and, if need be, a boost in transmission capacity (ideally underground or under water) so that we can benefit from Canadian hydropower (despite the problems inherent in large-scale hydro).

I realize that the DEP must contend with an array of challenging circumstances and difficult actors. I think the most important consideration to keep in mind is the disaster we face if we do not act expeditiously to rein in greenhouse gas emissions now, while at the same time aggressively acting to meet the GWSA goals for the years beyond 2020.

Thank you.

**From:** Elizabeth Rourke

**Sent:** Sunday, November 13, 2016 1:40:15 PM (UTC-05:00) Eastern Time (US & Canada)

**To:** Strategies, Climate (DEP)

**Subject:** Clean Energy and Climate Plan

Dear Massachusetts Department of Environmental Protection,

The Executive Order is an important and welcome first step. We appreciate it. The Governor has reaffirmed that climate change is a serious threat and that the Administration intends to meet the requirements of the GWSA.

That said, the Executive Order is not enough. Right now, we are **not** on track to hit the 2020 emissions reductions mandated by the GWSA. The Global Warming Solutions Act targets are not aspirational. They are legally required. The Supreme Judicial Court has ruled that the state has an obligation to put regulations in place that ensure we close the gap and achieve compliance by 2020.

We need specific plans and accurate accounting to ensure that the regulations created by the DEP get us to 25% below 1990 levels by 2020.

The current Clean Energy and Climate Plan (CECP) includes many key policies/programs intended to achieve compliance, but we are lagging in meeting 2020 targets and in implementing many of the measures contained in the plan.

Similarly, the new clean energy procurements included in the omnibus bill (hydro and offshore wind) are critical to helping MA transition to clean energy over the coming decades. But because those resources will not come online until after 2020, they will not help us meet the GWSA requirements.

We demand that you rapidly reduce green house gas emissions in the interest of protecting our children's and everyone's future. Gas leaks and new gas infrastructure should be a focus of these reductions. Fix the distribution system! Fix the super emitters! The Department of Environmental Protection should issue regulations that extend beyond 2020 on methane emissions to ensure continued reduction. DEP should also partner with independent researchers to help define "leaks of significant environmental impact." The administration should also factor GWSA impacts into decision making related to siting of new generation facilities and pipelines. Continuing to pursue new gas infrastructure is at odds with our need to comply with the GWSA.

Sincerely,

Elizabeth Rourke

**From:** Ruddock, Robert

**Sent:** Tuesday, November 15, 2016 4:56:36 PM (UTC-05:00) Eastern Time (US & Canada)

**To:** Strategies, Climate (DEP)

**Subject:** GHG Section 3d Comments: And Section 3c Comments

**Massachusetts Department of Environmental Protection**

**Climate Action Plan: Massachusetts Global Warming Solutions Act**

**Sections 3 (c) and 3 (d)**

**Bay State Hydropower Association Comments**

The Bay State Hydropower Association (BSHA) would like to thank the Department of Environmental Protection for the opportunity to provide comments as it considers the building blocks of new regulatory regimes to achieve the goals of the Global Warming Solutions Act (GWSA) for 2020 and in future decades. BSHA provides a forum for its members to discuss issues facing the industry and to address public policy matters, as well as educating the public. The Association represents nearly 90 percent of the hydropower facilities in Massachusetts, a great many are small (two megawatts or less capacity) and are family owned and operated, often for generations. The Association's member facilities are in-state providing employment and local tax revenues, geographically dispersed, and provide carbon free electricity.

Recently the Massachusetts Legislature recognized the value of small hydro facilities for carbon-free electricity and for public safety and environmental values including sustaining water supply infrastructure, including dams. This was accomplished in the "energy diversity" law, Section 10 of Chapter 188 of the Acts of 2016, where authority was given to the Department of Public Utilities to create a net metering program for small hydro facilities.

Small hydro facilities are facing difficult operating challenges because the market price they are paid for their carbon free energy is woefully small. Hard decisions are being forced on them about their ability to make repairs to generating equipment and even the maintenance of water supply infrastructure. This means that small hydro generation is being challenged to continue to contribute to the Massachusetts inventory of carbon-free generation. Operations may be curtailed and efficiency improvements or new facilities deferred or cancelled, resulting in less

carbon free electricity for the state to count on. The revenue for hydro power is inextricably linked to whether small hydro facilities continue to supply electricity with zero carbon emissions. Such carbon-free generation is essential for meeting the Commonwealth's GWSA goals in 2020 and 2050, and small hydro wants to play its part in achieving these goals.

Pursuant to Executive Order 569 and in responding to the Kain decision, the Department's multi-pronged regulatory process is focused on meeting the 2020 GWSA goal, as well as setting the table for meeting emission reduction and clean energy goals in future decades. The 2020 goal is a function of both emission reductions from sources AND continued contribution of power from carbon-free generation facilities in Massachusetts, as well as new clean energy sources. The 2020 reduction requirement is a "net" goal where the loss of carbon-free generation has to be made up from fossil generation (a bad thing) or keeping existing carbon-free generation and adding new zero carbon facilities. This delicate balance is complicated to achieve, but it clearly requires the Commonwealth, as an immediate and essential public policy requirement, to support existing carbon-free generation from small hydropower facilities. The Legislature's action in the "energy diversity" act clearly demonstrates this.

The Department of Public Utilities (DPU) is about to open a proceeding to create the net metering utility tariffs necessary to implement a modest new revenue stream necessary for small hydro facilities to continue their contribution to the Commonwealth's carbon reduction policy goals. The Association has urged the DPU to proceed quickly to create the tariffs by adopting emergency regulations and by urging all stakeholders to agree to a model net metering tariff. It is imperative this happens quickly so that there is no further deterioration or threat of deterioration of current carbon-free supply from small hydro, and so that there are incentives to increase production at existing facilities and build new facilities, including the use of new hydro power technologies.

It would be extremely helpful and timely for the Department of Environmental Protection to urge the DPU to act quickly in creating the net metering program authorized by the Massachusetts Legislature. The financial viability of small hydro facilities is directly connected to their ability to produce carbon-free electricity, and that production is tied directly to hydro's

important contribution of clean energy needed to get the Commonwealth to its 2020 GWSA goal, and similar goals in the coming decades.

We look forward to working with the Department in achieving the state's GWSA goals.

**Robert Ruddock**  
Senior Vice President

**Locke Lord Public Policy Group LLC**  
111 Huntington Avenue  
Boston, MA 02199  
T: 617-239-0245  
F: 617-227-4420  
[robert.ruddock@lockelord.com](mailto:robert.ruddock@lockelord.com)  
[www.lockelord.com](http://www.lockelord.com)

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**From:** Kathleen Scanlon  
**Sent:** Monday, November 7, 2016 1:46:05 PM (UTC-05:00) Eastern Time (US & Canada)  
**To:** Strategies, Climate (DEP)  
**Subject:** DEP hearing comments

Dear Department of Environmental Protection,

The Executive Order is an important and welcome first step. We appreciate it. The Governor has reaffirmed that climate change is a serious threat and that the Administration intends to meet the requirements of the GWSA.

That said, the Executive Order is not enough. Right now, we are **not** on track to hit the 2020 emissions reductions mandated by the GWSA. The Global Warming Solutions Act targets are not aspirational. They are legally required. The Supreme Judicial Court has ruled that the state has an obligation to put regulations in place that ensure we close the gap and achieve compliance by 2020.

We need specific plans and accurate accounting to ensure that the regulations created by the DEP get us to 25% below 1990 levels by 2020.

The current Clean Energy and Climate Plan (CECP) includes many key policies/programs intended to achieve compliance, but we are lagging in meeting 2020 targets and in implementing many of the measures contained in the plan.

Similarly, the new clean energy procurements included in the omnibus bill (hydro and offshore wind) are critical to helping MA transition to clean energy over the coming decades. But because those resources will not come online until after 2020, they will not help us meet the GWSA requirements.

We demand that you rapidly reduce green house gas emissions in the interest of protecting our children's and everyone's future. Gas leaks and new gas infrastructure should be a focus of these reductions. Fix the distribution system! Fix the super emitters! The Department of Environmental Protection should issue regulations that extend beyond 2020 on methane emissions to ensure continued reduction. DEP should also partner with independent researchers to help define "leaks of significant environmental impact." The administration should also factor GWSA impacts into decision making related to siting of new generation facilities and pipelines. Continuing to pursue new gas infrastructure is at odds with our need to comply with the GWSA.

Sincerely,

Kathleen Scanlon  
71 Francis Street  
Brookline, MA 02446

## **Written Comments on Regulations on Natural Gas Distribution System Leaks // Gas Leaks of “Significant Environmental Impact”**

I strongly support the Department of Environmental Protection issuing regulations on high-volume natural gas leaks from the distribution system as a very effective method of reducing emissions by 2020 and beyond.

My nonprofit HEET used utility data to map the gas leaks in over 200 municipalities across the state.<sup>1</sup> HEET has also partnered with Metropolitan Area Planning Council (MAPC) to interview 26 municipalities and 3 gas utilities in the Greater Boston about how to reduce the gas emissions in the fastest and least disruptive manner.<sup>2</sup>

From my work I know how destructive the emitted methane is to the climate, as well as how disruptive and expensive it can be to fix the leaks. This is why I am thrilled that leaks of “significant environmental impact” will be fixed on an accelerated schedule.

The Boston University 2016 study by Margaret Hendrick and Professor Nathan Phillips<sup>3</sup> found just 7% of gas leaks from underground pipes are responsible for emitting half of all the gas. Finding and fixing these high-volume leaks will cut our methane emissions from the distribution system in half. It is the fastest, least disruptive, least expensive method for reducing GHG that I’ve ever heard of (and I’ve been in the energy efficiency field for almost a decade).

In Cambridge there are approximately 200 utility-reported leaks. Thus there should be approximately 14 leaks of “significant environmental impact” (7% x 200). Fixing the correct 14 leaks should cut the city’s emissions from natural gas leaks in half.

Currently there are at least two studies I know on how to find and fix high-volume leaks. HEET in partnership with Professor Phillips, Columbia Gas, MAPC and the Sierra Club is testing several methods that will help utilities find high-volume gas leaks using utility instruments and techniques. Our results will be ready next summer. From conversations with Sue Fleck, Vice President, Pipeline Safety at National Grid, I know National Grid is running a similar study where they will test at least one method.

The one thing I can guarantee you is that our studies are not the only ones out there. Because methane emissions are so critical to reduce in order to stabilize the climate, the research and technology for this field is developing rapidly.

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<sup>1</sup> Please see [SqueakyLeak.org](http://SqueakyLeak.org) to see the maps.

<sup>2</sup> The MAPC/HEET report on the results of the year long research is at [FixOurPipes.org](http://FixOurPipes.org)

<sup>3</sup> Hendrick MF, Ackley R, Sanaie-Movahed B, Tang X, Phillips NG. 2016. Fugitive methane emissions from leak-prone natural gas distribution infrastructure in urban environments. *Environmental Pollution*. 213:710-716.

doi:10.1016/j.envpol.2016.01.094



To use an analogy, the level of research and technology around methane emissions in the distribution system is similar to the sophistication of the Internet back in 1995 when we all used dial up connections to access the world wide web. Things are going to improve quickly from here on out.

Thus, here's my advice. In your regulations around Grade 3 leaks of "significant environmental impact," please allow for the coming innovations by having verification, transparency and flexibility built into the regulations at the deepest levels.

**Specifically I recommend:**

1. The amount of gas emitting from the selected leaks be *measured*, not estimated, to ensure you're actually saving *real* GHG. Accurate feedback is the best way to improve any system.<sup>4</sup>
2. The data around each "significant" leak is made transparent, including how the leak was selected, its emissions and the pipe's pressure and material. Making this data public will allow for constant reassessment of the effectiveness of the methods and results and will increase stakeholder trust.
3. Annually have an independent and public reassessment of the regulations and results to allow for improvements.

Enacting these three recommendations will ensure the method and results improve as the research and technology improves, allowing Massachusetts to save the most greenhouse gas for the least cost to the ratepayers and the least disruption to our city streets. The transparency will increase stakeholder trust, and allow researchers and utilities across the country to learn from our state's trail-blazing actions.

Please, don't freeze us into 1995 where we are all using phones to call into AOL to hear we've got mail. Let science help you save increasing amounts of greenhouse gas emissions every year long past 2020.

Thank you for the opportunity to provide comment on these regulations.

Audrey Schulman, President  
HEET (Home Energy Efficiency Team)  
[Audrey.Schulman@HEETma.org](mailto:Audrey.Schulman@HEETma.org)

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<sup>4</sup> HEET is currently creating a list of different methods to use to measure the emissions from an excavated leak. Please contact us to get the list.

From: Maria Simoneau

Sent: Wednesday, November 16, 2016 7:48:18 AM (UTC-05:00) Eastern Time (US & Canada)

To: Strategies, Climate (DEP)

Subject: Gas leaks

Dear MA DEP:

I am writing to express my concern about the number of gas leaks that have gone unattended by the utility companies in Massachusetts. Recently I've learned that there are at least 177 Natural Gas leaks in the town of Arlington alone and approximately 20,000 statewide. There are streets in Arlington where one can actually smell the leaking gas. The methane from the Natural Gas leaks is bad for our health, bad for the plant life around us, adds to the warming of the planet and could pose a safety hazard. Also, we, the consumers, are the ones paying for lost and unaccounted for gas. For all these reasons, we need strict regulations to ensure that the gas companies fix all gas leaks. Identifying and fixing the largest leaks (the "super-emitters") should happen as soon as possible, but we also want all other gas leaks fixed in a timely manner.

Thanks in advance for doubling up the effort to address these problems. Maria Simoneau. Arlington homeowner.

**From:** Scott Smith

**Sent:** Wednesday, November 16, 2016 11:56:53 AM (UTC-05:00) Eastern Time (US & Canada)

**To:** Strategies, Climate (DEP)

**Subject:** Plugging Natural Gas Leaks

To Whom It May Concern,

I am writing to express my concern about the number of gas leaks that have gone unattended by the utility companies in Massachusetts.

Recently it has come to my attention that there are at least 177 Natural Gas leaks in the town of Arlington alone and approximately 20,000 statewide. There are streets in Arlington where one can actually smell the leaking gas.

The methane from the Natural Gas leaks is bad for our health, bad for the plant life around us, adds to the warming of the planet and could pose a safety hazard. Also, we, the consumers, are the ones paying for lost and unaccounted for gas.

For all these reasons, we need strict regulations to ensure that the gas companies fix all gas leaks. Identifying and fixing the largest leaks (the "super-emitters") should happen as soon as possible, but we also want all other gas leaks fixed in a timely manner.

The gas companies need to be incentivized to address this problem. As a rate payer, I would support substantial fines for failing to comply. Addressing these leaks is not only limits the damage being done to climate stability, but has economic benefits. Please see that the utilities act with all possible speed.

Thank you.

Scott J. Smith

**From:** Randi Soltysiak

**Sent:** Friday, November 11, 2016 1:18:08 PM (UTC-05:00) Eastern Time (US & Canada)

**To:** Strategies, Climate (DEP)

**Cc:** Randi Soltysiak

**Subject:** Comments in gas leaks regulations

Dear DEP,

I am very thankful that gas leaks are going to be regulated. Methane leaks contribute more to climate change than CO2. Climate change is the biggest threat to national security. Folks like you are the ones who need to connect the dots to keep us all safe. I urge you to require accurate measurements of the volume of gas being emitted and require that super-emitters be repaired immediately. You also need to regulate venting, storage, and all sources of fugitive gas. Thank you for your service to the people of Massachusetts. Now more than ever we need to be leaders on climate solutions. Please make the choices that will protect us.

Sincerely,

Randi Soltysiak

Mothers Out Front Volunteer

**From:** Colleen Spindler-Ranta

**Sent:** Wednesday, November 16, 2016 11:03:14 AM (UTC-05:00) Eastern Time (US & Canada)

**To:** Strategies, Climate (DEP)

**Subject:** Natural gas leaks in the state

Good morning:

I am writing to express my concern about the number of gas leaks that have gone unattended by the utility companies in Massachusetts. I am aware that there are approximately 20,000 leaks statewide and the methane from the Natural Gas leaks is bad for our health, bad for the plant life around us, adds to the warming of the planet, and could pose a safety hazard. Also, the consumers, are the ones paying for lost and unaccounted for gas. For all these reasons, we need strict regulations to ensure that the gas companies fix all gas leaks, in particular the largest leaks, as soon as possible. Thank you for your attention.

Colleen Spindler-Ranta  
Arlington, MA

November 21, 2016

Ms. Sharon Weber  
Deputy Division Director, Air & Climate Programs  
Department of Environmental Protection  
One Winter Street, 7th Floor  
Boston, MA 02108

Subject: Comments on GWSA 310 CMR 7.75 *Clean Energy Standard* and 310 CMR 7.77 *Reducing Greenhouse Gas (GHG) Emissions from Electricity Generating Facilities Program*

Dear Ms. Weber:

Braintree Electric Light Department (BELD), a municipal light department, hereby provides the following comments on the draft regulations that have been proposed in accordance with the Global Warming Solutions Act (GWSA). Specifically, we are providing comments on the whether it is appropriate to apply the Clean Energy Standard ("CES") (310 CMR 7.75) to municipal light departments and also, regarding BELD's (listed as Potter in Table A) proposed facility emissions cap listed in Table A of Section 7.77.

#### 310 CMR 7.75 Clean Energy Standard (CES)

In response to a stakeholder's meeting on October 27, 2014 and the Discussion Draft for the CES, several comments were provided by individual municipal light departments and also by the Municipal Electric Association of Massachusetts (MEAM) regarding the legality and challenges of the inclusion of municipal light departments (or "MLPs") in the proposed new CES under the GWSA. Previous comments submitted to MassDEP regarding the legality of imposing the CES on municipal electric light departments requested that MassDEP perform a legal analysis on this aspect.

BELD also believes that imposing a CES on BELD is in excess of MassDEP's legal authority. All agencies need some "organic" source of authority to engage in this type of regulation of an entity and MassDEP lacks this authority with regard to MLPs in this instance (it is not in St. 2008, c. 298, or as codified at G.L. c. 21N). Therefore, we request that MassDEP perform and make available a legal analysis on the applicability of the CES for review and comment prior to attempting to promulgate the final CES.

Key points supporting the lack of legal authority of MassDEP to impose a CES on municipal light departments are summarized below:

- *MassDEP must have either express or implied statutory authority to subject BELD and other MLPs to regulation under CES and here it has neither. See Comm'r. of Revenue v. Marr Scaffolding, 414 Mass. 489, 493 (1993). It appears that at least as of 2015, DEP*



is relying on a general pronouncement of "implied" authority to impose the CES regulations on MLPs. Courts will give special scrutiny to agencies claiming "implied authority" to issue regulations. Life Ins. Ass'n. of Massachusetts v. Comm'r. of Ins., 403 Mass. 410, 418 (1988).

- CES is being proposed to apply to MLPs by MassDEP not only to support the GWSA (i.e., according to MassDEP in the TSD) but also to "complement" the DOER's Renewable Portfolio Standard (RPS). This is insufficient to serve as "implied" authority to impose CES on MLPs. MLPs are not subject to RPS for good reason: unlike investor-owned utilities subject to rate regulation by the DPU, MLPs are subject to a different set of statutes governing their operations and rates at G.L. c. 164, §§ 34-69A. If DOER or the DPU imposes regulations regarding RPS on Investor Owned Utilities (IOUs), it is because those agencies exert regulatory authority over IOUs' rates under G.L. c. 164. By contrast, MLPs are creatures of statute; they are local entities, subject to local control, and their sales of electricity are subject to an entirely different statutory scheme from IOUs. For example, MLP rates are set according to a formula found at G.L. c. 164, § 58. Trying to regulate only "one corner" of this aspect of an MLP's operations through something like CES by boot-strapping through RPS requirements is not going to work because they are not subject to the same statutory scheme as those entities who account for 85% of the electric sales in Massachusetts (see TSD at page 4).
- MassDEP states on page 5 of the TSD that including MLPs is consistent with the general policy goals of the GWSA; however this is insufficient to confer legal authority on MassDEP to regulate MLPs in this regard. See Providence and Worcester Railroad Co. v. EFSB, 453 Mass. 135, 144 (2009) (agency's belief that it would like to have certain authority did not justify the agency in claiming that it had authority or power that the Legislature did not grant). There is nothing in G.L. c. 21N that specifically gives MassDEP the authority to subject MLPs to CES (currently they are only subject to reporting requirements under Section 2(a)). Such authority will not be implied from a "statutory vacuum." See Life Ins. Ass'n. of Massachusetts supra, at 418. Where the Legislature has specifically sought to include, or give authority to include an entity within a scope of a regulation, it has done so; excluding them here then is telling with regard to the Legislature's intent. See G.L. c. 164, § 2; Ianelle v. Fire Comm'r. of Boston, 331 Mass. 250, 252 (1954) ("Expressio unius est exclusio alterius.")
- Accordingly, BELD disagrees that DEP has any implied authority by virtue of G.L. c. 21N to impose CES on MLPs.

This conclusion is bolstered by G.L. c. 21 N, § 8, which requires the Secretary to convene an advisory committee of representatives of various sectors to advise the executive office in overseeing GHG reduction measures. MLPs are not included among the sectors listed in the statute. If the GWSA was intended to apply to MLPs generally, MLPs would have been expressly included in the advisory committee described in G.L. c. 21 N, § 8, in the same way they were included in the reporting provisions of G.L. c. 21 N, § 2(a)(5).

Another key factor that impacts BELD's ability to comply with the CES is that BELD has a long term hedging strategy in place in that we have at least 80% of our power supply needs locked up by years end for the following year. Because long term energy prices have been so low recently long term power contracts are continuously locked up if the price is attractive. For instance, we have already purchased power as far out as 2021. Following is the percentage of BELD's hedged energy needs by year:

- 2017: 81.2%
- 2018: 82.5%
- 2019: 84.0%
- 2020: 66.1%
- 2021: 52.0%

It should also be noted that MLPs include significant amounts of non-emitting generation. As reported in BELD's 2015 annual report, 10.7% of BELD's generation came from wind, solar, and hydroelectric and 15.8% from nuclear for a total of 26.5% of non-emitting generation. In 2014, BELD installed 1.2 MW of solar capacity that is under a long term purchase power agreement (PPA). Between 2012 and 2014, BELD installed an additional 0.5 MW of solar capacity at commercial and residential customer locations. Wind generating assets that supply BELD include Spruce Mountain Wind, Saddleback Wind, and Brown Bear Hydroelectric. Beginning in 2018, BELD will also obtain wind generation from the Canton Wind project.

In conclusion, we believe that MLPs, BELD included, should not be included as part of the CES. However, BELD is committed to implementing non-emitting generating assets and customer energy efficiency programs that will support the goals of the GWSA.

#### 310 CMR 7.77 Reducing Greenhouse Gas (GHG) Emissions from Electricity Generating Facilities Program

Beginning in 2018, 310 CMR 7.77 would establish a declining emissions cap for each power plant in Massachusetts and would allow for the creation and use of over compliance credits. These will be set such that aggregate GHG emissions from regulated power plants decline by 2020 to a level consistent with the electric sector strategies in the 2020 Clean Energy and Climate Plan (CECP) Update. The regulation would continue to reduce emissions caps by 2.5% of the 2018 cap each year from 2020 – 2050, yielding reductions consistent with the GWSA 2050 limit.

Under this new regulation, all facilities that trigger applicability under USEPA's GHG Reporting Rule (40 CFR 98) as an electric generating facility under Subpart D. This includes the Potter II combustion turbine and the two Watson combustion turbines at BELD. Based on the proposed draft rule, BELD's facility-wide cap will be 34,261 MT per year (37,766 tons per year). This allocation was based on historical actual emissions reported under 40 CFR 98 Subpart D GHG from years 2013-2015. BELD is requesting an alternate time period for calculation of their facility cap for calendar year 2018 as the reported 2015 GHG emissions are not representative of facility operations due to a long term outage of the Potter II combustion turbine beginning March 16, 2015 and continuing through 2015 and into the spring of 2016. The outage was caused by generator step-up transformer failure. Since the future reduced caps will be based on the initial cap set for calendar year 2018, it is imperative that BELD's initial cap be based on representative data.



A review of GHG emissions reported to USEPA under Part 98, Subpart D shows the three year average tonnage of GHGs was 35,363 metric tons (38,981 tons) for calendar years 2013-2015. For calendar years 2012-2014, the annual average tonnage of GHGs is 39,533 metric tons (43,577 tons), 15 % higher than 2013-2015. Average Subpart D GHG emissions for calendar years 2010-2016 were 38,294 metric tons (42,212 tons). The Potter II outage, in early 2015 that continued until the spring of 2016 yielded lower MWs generated and corresponding lower GHG emissions. The step-up transformer has been repaired and Potter II is operational.

BELD's current allocation of 34,261 metric tons represents 0.38% of the State's total GHG budget. If the baseline years were changed to 2012-2014, BELD's allocation would increase to 0.43%, an increase of 0.06%. Assuming the same ratio of allocation cap to 3-year average emissions, BELD's new proposed cap would be 39,533 metric tons (43,577 tons). Due to the extended outage of Potter II during 9 months in 2016 and 4 months in 2016, we request that our 2018 emissions cap be based on calendar years 2012-2014.

We appreciate the opportunity to comment on both draft proposals. If you have any questions, please contact me at (781) 348-1031 or [kstone@beld.com](mailto:kstone@beld.com).

Sincerely,



Kenneth E. Stone  
Energy Services & Accounting Manager  
Braintree Electric Light Department  
150 Potter Road  
Braintree, MA 02184  
781-348-1031  
[kstone@beld.com](mailto:kstone@beld.com)

# Subpart D Reported GHGs

	Unit 3	Unit 4	Unit 5	Watson/Potter Total (tons)
2016	4,771.60	12,667.10	12,022.50	29,461.20
2015	-	10,412.40	13,286.30	23,698.70
2014	2,395.00	24,025.70	22,979.10	49,399.80
2013	11,547.50	16,534.00	15,764.40	43,845.90
2012	5,551.40	17,448.00	18,693.10	41,692.50
2011	5,553.40	15,487.50	13,476.10	34,517.00
2010	13,058.30	29,664.40	30,143.00	72,865.70

Data taken from ECPMS Emissions Database.

average	tons	42,211.54
	metric tons	38,293.71

Facility Wide Cap:

34,261 MT      37,766.24 tons

Watson 4 and 5 - 2015 GHG as a % of 2014 GHGs  
43.34%    57.82%

BELD's % of total state allocation for existing sources	
Using 2013-2015	
0.38%	
difference	9,119,126
0.06%	State allocation for
Using 2012 to 2014	existing sources
0.43%	(metric tons)

116,944.40	total for 2013-2015 (tons)
38,981.47	average 2013-2015 (tons)
35,363.43	average 2013-2015 (metric tons)
0.97	0.97 ration of allocation to 2013-2015 average actual
134,938.20	total for 2012-2014 (tons)
44,979.40	average 2012-2014 (tons)
43,577.19 tons	average 2012-2014 (tons) ratioed to by 97% based on ration of average for 2013-2015
39,532.61 metric	proposed new allocation metric tonnes
additional GHG tons	5,271.61    metric tons
if allocation based on	5,810.95    tons
2012-2014	
versus 2013-2015	



November 21, 2016

Massachusetts Department of Environmental Protection  
Division of Air and Climate Programs  
One Winter Street – 7<sup>th</sup> floor  
Boston, MA 02108  
Attn: Jordan Garfinkle  
[climate.strategies@state.ma.us](mailto:climate.strategies@state.ma.us)

Re: Comments on MassDEP's 2016 Clean Energy Standard Proposal

Dear Mr. Garfinkle:

National Grid (hereinafter, “we” or the “Company”) appreciates the opportunity to provide comments to the Massachusetts Department of Environmental Protection (“MassDEP”) on the potential implementation of a Clean Energy Standard (“CES”) to help ensure that the Commonwealth meets the statewide emissions limits set forth in the (“Global Warming Solutions Act”) GWSA.

The Company is supportive of many policy programs necessary to meet the emissions reduction commitments such as Regional Greenhouse Gas Initiative (“RGGI”), the Commonwealth’s commitment to energy efficiency, and long-term goals for the use of renewable energy, all of which have contributed to lowering the level of emissions throughout the region over the last decade. However, we strongly believe that implementing a CES would not be beneficial for the MassDEP to meet the GWSA goals, nor is it required or even necessary to comply with the directives set out in Kain v. Department of Environmental Protection, 47 Mass. 278 (2016), or Executive Order 569, to satisfy the mandate of Section 3(d) of the GWSA. At the very least, a careful examination of the need to add any more costs related to new programs, especially ones that seem duplicative to emission reducing initiatives<sup>1</sup>, is warranted. Accordingly, we offer the following comments.

## **I. A CES WOULD NOT ADD VALUE TO REDUCING EMISSIONS**

The Company does not believe that the proposed CES is an appropriate solution to the challenges presently facing MassDEP to meet the GWSA goals. In our view, the proposed CES is duplicative as it is substantially based on the designs of several existing programs and may actually be counter-productive to existing regulation of greenhouse gas emissions. Specifically, we oppose adoption of this new regulation for four main reasons:

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<sup>1</sup> Initiatives include: (1) the Renewable Energy Portfolio Standards (“RPS”) and Alternative Energy Portfolio Standards (“APS”); (2) programs designed to reduce greenhouse gas emissions, such as RGGI; long-term power purchase agreements, including directives included in the recently passed legislation, An Act to Promote Energy Diversity (Ch. 188, the Acts of 2016) (hereinafter, the “Act”).

- 1) The CES approach is less cost effective than the primary existing program (RGGI) designed to reduce greenhouse gas emissions from the power generation sector;
- 2) RGGI already has strong support and, along with RPS and APS, represent a significant investment for all utility customers in the Commonwealth;
- 3) Existing and recently approved electric sector initiatives may meet the sector goals without a CES;
- 4) The resource most likely to be subsidized by a CES – large hydroelectric from Canada – has not been shown to need a subsidy like this to be built in Canada and sold into New England

1. A CES would compete with RGGI, undermining its effectiveness

The Commonwealth is already a participant in and a leading advocate for the most cost-effective and wide scale program available, RGGI, which has recently seen the impacts of the downward emissions cap and banked allowance adjustments that the RGGI states made to the program a few years ago.<sup>2</sup> National Grid has been supportive of the RGGI review process currently underway and suggests that awaiting the results of the program redesign before even contemplating adding a CES.

2. Adding to existing Clean Energy Programs increases costs unnecessarily

Existing clean energy programs already require strong financial commitments from Massachusetts customers. For example, the substantial energy savings goals of the energy efficiency programs; the introduction of both Solar Carve-Out phases in the RPS; and the subsidies provided through net metering, particularly virtual net metering, has boosted the total cost for these programs substantially for National Grid customers. National Grid anticipates that adoption of a CES would result in a significant increase in retail energy costs to Massachusetts customers, who already face some of the highest energy costs in the nation.

Further, it is the Company's understanding that the proposed CES would be designed to function in a manner similar to, and compatible with, the existing RPS administered by the Department of Energy Resources. Since RPS requirements increase every year, there may not be a surplus of renewable energy certificates ("RECs") in future years, causing the demand and, consequently, price of RECs to increase. Additional considerations include:

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<sup>2</sup> A February 2014 paper, Designing by Degrees: Flexibility and Cost-Effectiveness in Climate Policy, compared the cost effectiveness of different approaches to carbon emission regulation and found that a tradable cap or carbon tax, like RGGI, is 40% less costly in economic losses for the same CO2 reduction than a technology restricted certificate scheme, like the proposed CES. See Anthony Paul, Karen Palmer, Matt Woerman, *Designing by Degrees: Flexibility and Cost-Effectiveness in Climate Policy*, Resources for the Future (2014). <http://www.rff.org/files/sharepoint/WorkImages/Download/RFF-DP-14-05.pdf>. The study was based on national modeling, and not specific to RGGI or New England, but it illustrates major differences in economic efficiency between the two approaches. Id.

- A CES with a REC-trading framework is unlikely to spur near-term renewable development. This has been a weakness of the RPS which was eventually attempted to be rectified through the contracting standards of Sections 83 and 83A of the Green Communities Act and the recently passed Act.
- If CES uses a REC-trading framework, the demand, and therefore price, for RPS RECs will increase if a low ceiling price is not implemented. Customers are expected to pay approximately 1.85 cents per kWh to comply with RPS and APS in 2017 even though Class I REC prices are relatively low compared to recent years. If the CES is implemented, the RECs may trade as high as the Alternative Compliance Payment (“ACP”), significantly increasing the cost to customers for both CES and RPS compliance. When considering the estimated costs of CES, MassDEP should also consider the costs on other parts of the market such as RPS, Energy Efficiency and RGGI.

### 3. Existing and Recently Approved Initiatives May Meet GWSA Goals

For example, by 2020, at least 23.5 percent of the retail electric load is projected to be met by these programs. Undertaking an extrapolation, by 2030, at least 36 percent of the retail electric load is projected to be provided by RPS and APS resources. Extrapolating that amount further, by 2050, that amount is projected to be 61 percent. These cleaner resources will eventually replace much of the remaining fossil fuel generation. To ensure the supply of Class I resources available to meet the RPS, the legislature passed Sections 83 and 83A, which authorizes electric distribution companies to enter into long-term contracts with particular generation sources. Additionally, the recently enacted Act directs electric distribution companies to procure 1600 MW of offshore wind by 2027. These wind projects will generate approximately 6.59 million MWh per year, or approximately 14 percent of the Commonwealth’s retail distribution load<sup>3</sup>. Sections 83, 83A, and the Act will therefore promote Class I resources to assist in the GWSA goals.

The Act also requires the distribution companies to contract for 9.45 million MWh of clean energy, including Canadian large-scale hydro. This is equivalent to approximately 20 percent of the Commonwealth’s distribution load. Thus, in theory, without a full reliability analysis, at least 56 percent of the retail electric load is projected to be met by RPS, APS, and large scale hydro by 2030. Further, by 2050, at least 81 percent of the retail electric load is projected to be met by all resources. In addition, many pollutant generators are expected to be replaced by cleaner natural gas and renewable energy generators. For all of these reasons, the goals of the GWSA are projected to be met without the additional cost and complexities associated with a CES.

### 4. The CES Subsidy Is Not Needed by Those Likely to Receive It

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<sup>3</sup> DOER Energy Markets, Department of Energy Resources, *2015 Electric Customer Migration Data* (2015), available at <http://www.mass.gov/eea/grants-and-tech-assistance/guidance-technical-assistance/agencies-and-divisions/doer/electric-customer-migration-data.html>.

There is no evidence that the generation companies that would mostly likely develop the sources of new clean energy called for by the CES – large-scale hydroelectric facilities – need this kind of subsidy, or whether the CES would be effective in supporting such developments, or related transmission facilities. These entities were already building thousands of new megawatts of new hydroelectricity in Canada, without contracts and without a CES. Further, as mentioned previously, the Act requires the electric distribution companies to procure significant amounts of clean energy through long-term contracting, including large-scale hydroelectric facilities, creating an even bigger incentive for the construction of these projects. An additional subsidy provided via a CES is therefore unnecessary to increase the availability of this resource.<sup>4</sup>

## **II. COMMENTS ON QUESTIONS PRESENTED**

Notwithstanding our comments urging MassDEP to reconsider implementing a CES at this time, the Company offers the following comments on the specific questions listed in the Clean Energy Standard Discussion Document found on the MassDEP website.

### **1. When should the CES take effect, and should the CES remain in effect until 2050?**

The CES should not be implemented in the short-term. We estimate that, by 2030, 56 percent of retail electric sales will be provided by large scale hydro or Class I generation (45 percent) and Class II, Class II Waste Energy and APS generation (11 percent). Accordingly, the Company believes that, by 2030, significant progress will have been made towards the goal of 80 percent reduced emissions in 2050 in the electric sector, compared to 1990, that can be achieved through the electric sector, and the focus should be on needed contributions from and transformation in the heating and transportation sectors. Accordingly, the MassDEP should rescind consideration of the CES as an unnecessary additional regulatory structure.

### **2. What should the standard (expressed as a percent of electrical load) be for each year, or how should it be determined?**

National Grid would like MassDEP to rescind consideration of a CES. However, in the event a CES is adopted, the standard as a percent of electrical load should be calculated yearly to determine the appropriate emission level for the coming year. The formula should include, among other things, 1990 emissions levels, 2050 target emission levels, an approximate emission level for the coming year, reduction of emissions to date and expected reductions in coming year from other initiatives such as vehicle regulations. If the reduction of emissions to date already exceeds the approximate emission level for the coming year, then the CES should be 0 percent. If reductions to date do not meet the target, the MassDEP should apply the expected reduction of

<sup>4</sup>

What those resources need instead is the transmission capacity to deliver energy to the New England market, where RGGI – as well as seasonal gas constraints – are making wholesale electric prices for carbon-free, non-natural gas resources more and more attractive. Finding ways to secure that transmission capacity, via regional agreement, using any of a number of allocation mechanisms for the costs, would enable that power to flow to ISO-NE and create hundreds of millions of dollars in benefits, with increased supply of energy and increased competition that comes with that added supply.

emissions due to RPS and other renewable initiatives in the coming year. The MassDEP should be flexible if it is aware of a new clean energy project coming online in the near term and include it in its calculation. Any remaining reduction should be divided by expected load to determine a percent of electrical load for the coming year.

3. Should municipal light plants be required to comply?

Yes, we recommend the inclusion of municipal light plants (“MLPs”) in any CES that might be adopted, or any other regulation meant to deliver the same objectives. MLPs and their customers, which are almost 15 percent of the Commonwealth’s retail load, are not subject to RPS or other renewable initiatives. Customers of Investor Owned utilities (“IOUs”) have paid for most of the Commonwealth’s clean energy initiatives (RPS, Section 83, solar, etc.). The CES would be an opportunity to ensure that all customers who benefit from clean energy pay appropriate costs. Further, including MLPs should lower the overall obligation percentage since the standard is applied to a larger retail load, thereby lowering the average cost per customer. MassDEP should also consider whether MLPs should pay more than IOU customers for a CES since IOU customers will continue to bear the costs for the Commonwealth’s pre-existing programs.

4. Should eligibility for clean generators be based on a list of “clean” technologies, or on an emissions threshold? How should the list of technologies or the emissions threshold be determined?

Yes, we recommend the inclusion of any technology that helps the Commonwealth meet its goal to reduce emissions by 2050.

5. Should eligibility for clean generators be limited to “new” facilities? If so, what should the cutoff for being considered new? What about transmission capacity for electricity imported into New England?

No, the eligibility should not be limited to “new” facilities. The Company recommends that a CES expand the eligibility criteria to include any form of clean energy generation, regardless of commercial operation date or technology, which could assist in achieving the goals of the GWSA. The Company believes that the operation of existing generation is vital and therefore advocates the inclusion of all renewable energy generators in the CES regardless of commercial operation date. We believe it is imperative that these older units stay in service to meet the Commonwealth’s goals.

6. Should the CES include flexibility options such as an alternative compliance payment?

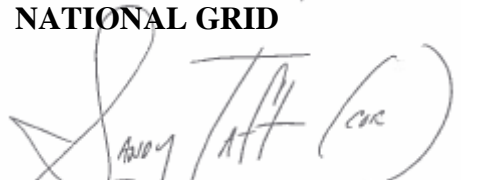
MassDEP should not promulgate the CES regulations, and thus should not have an ACP structure for such implementation. To the extent any CES program is eventually adopted, however, an ACP mechanism should be part of the structure to limit the costs of implementation.

### III. CONCLUSION

In closing, National Grid appreciates the opportunity to comment on a proposed CES standard. However, we believe the tools are already in place to meet the goals of emission reductions in the electric sector without the additional cost and complexities of a CES. However, in the event that MassDEP moves forward with implementing a CES, we recommend a careful examination of the cost, structure, implementation schedule, participants and resource eligibility, among other things. We look forward to further discussions with MassDEP and other stakeholders on the proposed regulatory changes aimed at reducing emissions and encouraging clean energy growth in the Commonwealth.

Sincerely,

**NATIONAL GRID**

A handwritten signature in black ink, appearing to read "Sandy Taft (cnc)", is written over a horizontal line.

Alexander (Sandy) G. Taft  
Director, Environmental & Sustainability Policy  
[781-907-3640](tel:781-907-3640)/[Sandy.Taft@nationalgrid.com](mailto:Sandy.Taft@nationalgrid.com)





November 16, 2016

Massachusetts Department of Environmental Protection  
Division of Air and Climate Programs  
One Winter Street – 7<sup>th</sup> floor  
Boston, MA 02108  
Attn: Will Space/Jordan Garfinkle  
[climate.strategies@state.ma.us](mailto:climate.strategies@state.ma.us)

Re: **Comments on MassDEP's proposed amendments to 310 CMR 7.72 *Reducing Sulfur Hexafluoride Emissions from Gas-Insulated Switchgear***

Dear Mr. Space and Mr. Garfinkle:

National Grid would like to thank the Massachusetts Department of Environmental Protection (MassDEP) for the opportunity to comment on the proposed amendments to the current regulation controlling emissions of sulfur hexafluoride (SF<sub>6</sub>) from gas-insulated switchgear (GIS). The current SF<sub>6</sub> regulation, promulgated in 2014 and effective in January of 2015, applies to Federal Reporting GIS Owners who are required to report SF<sub>6</sub> emissions to U.S. EPA pursuant to 40 CFR Part 98, Subpart DD. It mandates companies that own, lease, operate or control the largest amount of GIS to meet a company-wide declining emission rate that ultimately reaches 1% by 2020. In Massachusetts, the two largest GIS Owners are Eversource and National Grid. As one of these two companies subject to this regulation, National Grid (also referred to hereafter as "we" or the "Company") is directly impacted by the regulation and proposed amendments.

Further, the Company understands the directives set out in Kain v. Department of Environmental Protection, 47 Mass. 278 (2016), and Executive Order 569, to satisfy the mandate of Section 3(d) of the Global Warming Solutions Act (GWSA), and appreciates the opportunity to provide comments to and work collaboratively with MassDEP to help ensure that the Commonwealth meets the 2020 statewide emissions limits set forth in the GWSA. Thus, we offer the following comments.

#### **Draft SF<sub>6</sub> Emission Cap Levels**

National Grid has reviewed the proposed emission cap levels in the redline document dated November 7, 2016 on MassDEP's stakeholder website. As it pertains to National Grid, those cap levels as drafted in 310 CMR 7.72(5)(b) are as follows:

Maximum Annual SF6 Emissions - National Grid	
Calendar Year	Maximum Allowable SF6 Emissions (lbs.)
2018	2,644
2019	2,082
2020	1,457

Based on National Grid's projected growth, which the Company calculates using projected nameplate capacity, these cap levels appear to be appropriate.

It is important to emphasize that National Grid's ability to accurately estimate our growth extends only through the year 2020. Our growth projections are certainly projections, the accuracy of which will decrease the farther out they are projected. We cannot specifically determine the quantity of SF6 that will exist or be needed in our equipment for future growth beyond 2020. As such, we strongly encourage MassDEP to limit the emission cap period to calendar years 2018-2020, which the draft amendments appear to do. National Grid supports this as the applicable regulatory time frame for the cap.

#### **Maximum Annual SF6 Emission Rate Beyond 2020**

The emission rate in the current regulation remains unchanged. It is as follows:

Maximum Annual SF <sub>6</sub> Emission Rate	
Calendar Year	Maximum Allowable SF <sub>6</sub> Emission Rate
2015	3.5%
2016	3.0%
2017	2.5%
2018	2.0%
2019	1.5%
2020, and each calendar year thereafter	1.0%

National Grid accepts that the 1% allowance rate "for 2020, *and each calendar year thereafter*" has been established. 310 CMR 7.72(5)(a) (emphasis added). The Company's understanding of the chart above as well as the slides provided to stakeholders is that MassDEP's intention is to keep the 1% allowance rate in place for any future years beyond 2020. Indeed, MassDEP's notes state: "After 2020, the leakage rate would remain in place and allow for growth in GIS capacity."<sup>1</sup>

While the Company questions whether a 1% allowance rate is appropriate, we want to emphasize that we would not support any future regulatory proposal to have the rate further decline below 1%.

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<sup>1</sup> See GWSA Regulations Stakeholder Meeting, slides on gas-insulated switchgear, available at: <http://www.mass.gov/eea/docs/dep/air/climate/2-gwsa-sf6.pdf>, page 11.

Our primary reason for this position is that, although alternative technologies to SF6 are being explored, there are currently no alternatives in the marketplace that can substitute for SF6 in all types of equipment installed within National Grid's operating system. The Company is utilizing alternatives wherever possible, such as the use of vacuum interrupters in low-voltage breakers, but this technology is not available for higher voltage breakers.

Therefore, because National Grid cannot guarantee our technical ability to comply with the 1% rate each and every year into the future, nor do we have any mechanism to ensure the reliability of the system is not compromised if we were forced to install unproven alternatives to SF6, we would oppose any attempt in future amendments to define a more stringent rate.

### **Numerical Cap vs. Cap-Setting Formula**

National Grid supports the use of the numerical emission cap up to the year 2020, and does not support a cap-setting formula. We believe a numerical cap is a straightforward approach to this regulation and complies with the mandate of Section 3(d) of the GWSA as affirmed by the Kain decision.

Similar to our concerns expressed above, while we can gauge our ability to comply with the 1,457-pound cap for 2020 because it is in the near term, if MassDEP were to amend the regulation to later create an emissions cap below that amount, National Grid is concerned with the feasibility of compliance. In particular, at increasingly low emission levels, the Company has reservations about the accuracy of the mass balance approach to calculating annual emissions.

Moreover, given that GIS owners are operationally unable to eliminate all emissions from GIS equipment across all service territories, if MassDEP considers future individual emissions caps for years beyond 2020, those caps cannot be set unreasonably low, to a level that does not accommodate the unavoidable minimum amount of emissions expected from a large electrical operating system. Thus, if MassDEP does revisit the numerical emissions cap in the future, we encourage the Department to avoid setting any cap that results in compliance being impossible for the Company despite having a robust program for phasing out any leak-prone equipment and investing heavily in capital improvements across our system.

If MassDEP determines that a cap-setting formula is necessary, our proposal is to use the nameplate capacity at end of the year multiplied by 1% for 2020 and each year thereafter, as it has done in 310 CMR 7.72(5)(a). We recognize the circular logic in this proposal, because that is the formula presently used, but we believe the formula resulting in the existing allowance rates is appropriate, and in alignment with the numerical emission cap that National Grid believes is achievable.

For the reasons stated above, National Grid reiterates the value of limiting the emissions cap included within these amendments to the year 2020 and not beyond.

### **Joint Compliance/Aggregated Cap**

MassDEP requests comment on whether the regulation should incorporate an option for joint compliance based on the aggregate cap. National Grid is not conceptually opposed to the use of an aggregate cap to create joint compliance and meet the spirit of the GSWA, as affirmed by Kain. In terms of enforcement, however, National Grid does not support the aggregate cap as the tool to determine compliance with the regulation.

Section 3(d) of the GWSA requires MassDEP to promulgate regulations that establish a desired level of declining aggregate GHG emissions limits. MassDEP can meet this requirement by setting individual caps for each GIS owner. These individual caps, when combined, will result in declining aggregate emissions. Compliance itself, however, should be based *only* on whether each GIS owner meets its individual cap.

An individual GIS owner can only take steps to reduce emissions on its own electrical operating system and should therefore only be held accountable for its individual actions or inactions. We are concerned that National Grid's ability to make decisions about infrastructure planning and capital improvements will be hampered if our use of SF6 in our operating system is directly tied to the activities of other GIS owners, over which we have no control. National Grid therefore cautions against intertwining individual GIS owners in an aggregated enforcement scheme.

Furthermore, the Company does not interpret Section 3(d) of the GWSA or the Kain decision to require MassDEP to determine an individual source's compliance based on both its individual cap and aggregate cap, and then pursue enforcement actions against that source depending on non-compliance with either or both caps. Instead, National Grid believes the aggregate cap should be used solely as an informational tool to demonstrate that, as a whole, the GIS owners' emissions caps comply with Section 3(d)'s mandate for declining annual aggregate emissions limits.

To address this issue within the draft regulation itself, National Grid believes 310 CMR 7.72(5)(b)(2) should be revised to add language that clarifies that the aggregate cap is for informational purposes only, and a statement to the effect that "neither GIS owner will be held accountable for failure to meet the aggregate cap, rather only that GIS owner's individual cap." The Company also supports the use of alternative compliance options to comply with each GIS owner's individual cap, and encourages MassDEP to include such language in the revised amendments to the regulation.

### **Emergency Event Exemption**

National Grid encourages MassDEP to provide more clarity to the emergency event provision found at 310 CMR 7.72(7). We believe the language of Section (7)(a)(1) should be slightly modified to provide MassDEP more flexibility in determining what qualifies as an emergency event. In particular, we recommend amending Section (7)(a)(1) to state: ". . . (1) Was caused by an emergency event, including but not limited

to fire, flood, earthquake, or other severe weather events, accident beyond the GIS owner's control, or act of third-party damage or vandalism; and . . .". This clarification is important to GIS owners to enable such owners to understand the intent of the exemption as it interplays with sub-sections (7)(a)(2), (7)(a)(3) and (7)(a)(4), and appropriately report emergency events in annual reports submitted by the GIS owner.

In closing, National Grid is interested in helping to amend this regulation in a manner that will benefit both its customers and the environment, and is accordingly open to future discussions with MassDEP on the proposed regulatory changes aimed at controlling SF6 emissions.

Sincerely,

**NATIONAL GRID**

A handwritten signature in cursive script that reads "Sandy Taft /CAA".

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Alexander (Sandy) G. Taft  
Director, Environmental & Sustainability Policy  
[781-907-3640](tel:781-907-3640)/[Sandy.Taft@nationalgrid.com](mailto:Sandy.Taft@nationalgrid.com)



50 ROWES WHARF | BOSTON, MA 02110 | P:617-330-7000  
800 CONNECTICUT AVE. NW | WASHINGTON, DC 20006 | P:202-794-6300  
99 WILLOW STREET | YARMOUTHPORT, MA 02675 | P:508-362-6262

Christopher Pollart  
Direct Dial: 617-330-7003  
E-mail: CPollart@rubinrudman.com

November 21, 2016

Commonwealth of Massachusetts  
Department of Environmental Protection  
One Winter Street  
Boston, MA 02108

Re: Proposed Clean Energy Standard – Applicability to Municipal Light Plants

Dear Sir/Madam:

The Taunton Municipal Lighting Plant (“TMLP”) files these comments in response to the Massachusetts Department of Environmental Protection’s (“MassDEP”) request seeking stakeholder feedback regarding options for implementing a Clean Energy Standard (“CES”). TMLP also directs MassDEP’s attention to the comments that TMLP previously filed with MassDEP on April 27, 2015. Among other issues, the MassDEP seeks input on whether municipal plants should be required to comply with the proposed CES. While TMLP appreciates the MassDEP’s efforts to mitigate and reduce greenhouse gas emissions in furtherance of its mandate under the Global Warming Solutions Act (“GWSA”), TMLP urges the MassDEP to exclude municipal light plants from a mandatory CES obligation. In short, the imposition of a CES obligation on municipal light plants that have not opened up their service territories to competition is not supported by the language of M.G.L. c. 21N and is inconsistent with the longstanding statutory and regulatory schemes governing municipal light plants.

On September 16, 2016, the Governor issued Executive Order No. 569 entitled “Establishing an Integrated Climate Change Strategy for the Commonwealth” directing the MassDEP to take certain actions to mitigate and reduce greenhouse gas. The Order does not expressly require any energy-specific actions, but rather directs the Secretary of Energy and Environmental Affairs to “continue to lead on reform of regional wholesale electric energy and capacity markets to ensure that state mandates for clean energy are achieved in a cost effective manner.” The Order also directs the MassDEP to promulgate final regulations that satisfy the mandate of M.G.L. c. 21N, § 3(d) to ensure that the Commonwealth meets the statewide emissions limits mandated by the GWSA. The Order does not specifically require the MassDEP to take any actions under M.G.L. c. 21N, § 3(c) pertaining to the electric sector. Rather, that effort involves a collaborative effort between the MassDEP and the Department of Energy Resources (“DOER”) to establish emission levels and limits based on consumption and purchases of electricity from the regional electric grid, taking into account the regional

greenhouse gas initiative and the Renewable Portfolio Standard (“RPS”). Nothing in the Order or M.G.L. c. 21N authorizes the MassDEP to regulate power purchases of municipal light plants.

Indeed, the regulation of municipal light plants as retail suppliers of electricity regardless of whether they have opened up their service territories to retail competition represents a sharp departure from the existing statutory and regulatory framework. Nothing in M.G.L. c. 21N, or even chapters 25, 25A or 164, evinces any legislative intent to subject municipal light plants to regulation as retail suppliers or to mandate their participation in one-size-fits-all programs designed to promote clean energy or other environmental objectives through mandatory purchases or compliance payments. Municipal light plants differ from investor-owned utilities in several fundamental ways. They are relatively small, they are subject to local control, have no shareholders and do not participate in the market of providing competitive retail electric supply. Some municipal light plants only have a few hundred customers. The funding mechanisms and resources among municipal light plants also vary significantly. As such, municipal light plants face unique challenges.

Recognizing their unique position, the Legislature has consistently recognized that municipal light plants should not be subject to the same statutory and regulatory obligations as private, investor-owned utilities, even with respect to measures that promote clean energy. Notably, municipal light plant power purchases are not subject to regulation or approval by the Department of Public Utilities (“DPU”) under M.G.L. c. 164, and municipal light plants are not required to solicit proposals for the purchase of renewable generation like investor-owned utilities are required to do. *See, e.g.*, St. 2016, c. 188, § 83C (offshore wind); Section 83A of the Green Communities Act as added by St. 2012, c. 209 “*An Act relative to competitively priced electricity in the Commonwealth*” (energy and Renewable Energy Credits (“RECs”) from renewable generation facilities). As the DPU has acknowledged, because of the statutory framework governing municipal light plants, the DPU ought to defer to the judgment of elected municipal officials in many matters pertaining to management of municipal light plants, including contracts for power supplies. *See Newbay Corp.*, D.P.U. 265, at 18 (1994).

Moreover, the Legislature consistently has exempted municipal light plants from participation in mandatory clean energy-related programs applicable to investor-owned utilities to enable them to maintain local control of their initiatives. Under M.G.L. c. 25, §§ 19 and 20, municipal light plants are exempt from mandatory charges designed to promote and require the purchase of energy from renewable energy projects. With the passage of the Green Communities Act in 2008, the Legislature preserved municipal light plant exemptions for mandatory energy efficiency and renewable energy charges and the exemption for mandatory RPS obligations so long as and insofar as the municipal light plant is exempt from the requirements to allow competitive choice of generation supply pursuant to G.L. c. 164, § 47A. *See* St. 2008, c. 169, § 32 (amending G.L. c. 25A, § 11F). Likewise, the Green Communities Act also exempts municipal light plants from Alternative Energy Portfolio Standards (“APS”) and power purchase obligations. *See* M.G.L. 25A, § 11F½(d). Similarly, the Legislature did not subject municipal light plants to mandatory net metering requirements, which are designed to promote customer-owned or operated renewable, basically solar, energy projects. *See* M.G.L. 164, §§ 138, 139. Plainly, at the time of the passage of the GWSA in 2008, the Legislature clearly and undisputedly manifested an intention through specific statutory language to exempt

municipal light plants from a host of mandatory clean energy obligations and required power purchases. This entire statutory and regulatory scheme involving municipal light plants should be interpreted so as to form a harmonious whole. *See North Shore Vocation Reg. School Dist. v. Salem*, 393 Mass. 354, 358-60 (1984); *see also Vining Disposal Service v. Board of Selectmen of Westford*, 416 Mass. 35, 38 (1993).

Imposing a mandatory CES obligation on municipal light plants would impermissibly circumvent statutory provisions exempting them from RPS requirements by basing CES compliance in large part on compliance with RPS. The MassDEP Clean Energy Standard Discussion Document states that “the CES would function in a manner similar to, and compatible with the existing RPS administered by the Department of Energy Resources.” Moreover, as reflected in the Clean Energy Standard Overview, the CES would be similar to the existing RPS program, which would require retail sellers to include a minimum percentage of electrical energy sales with clean generation attributes. “Clean energy” would include RPS-eligible renewable energy resources as well as other non-emitting technologies. As the MassDEP envisions, RPS compliance would count towards CES compliance but additional clean energy would be required to comply with higher CES requirements. Retail sellers also could use NEPOOL – GIS certificates to demonstrate compliance. In contrast to M.G.L. c. 21N, M.G.L. 25A, § 11F contains a clear directive to impose RPS obligations on retail suppliers, and notably, municipal light plants who do not participate in retail competition are exempt (*i.e.*, municipal light plants that do not sell power at retail outside of their service territories). *See* M.G.L. 25A, § 11F (i). There is no statutory or rational legal basis to impose a similar obligation on municipal light plants now, particularly given that municipal light plants and their customers are ineligible to receive benefits and funding from the Commonwealth’s Mass Save and Green Communities programs. Given that municipal light plants do not have RPS obligations, and given that their existing renewable energy and existing zero/low GHG emitting purchases may not meet CES eligibility requirements for technical reasons, a mandatory CES purchase obligation also is unreasonable and inherently unfair to municipal light plants. While the MassDEP has discretion in establishing the parameters of its authority, the court will not hesitate to overrule agency interpretations when such interpretations are unreasonable. *See Kain v. Dept. of Env. Protection*, Docket No. SJC-11961, at \*4 (slip. op. 2016).

Notably, the statute itself – M.G.L. c. 21N does not include any language supporting a legislative intention to include municipal light plants in mandatory initiatives. As set forth in M.G.L. c. 21N, § 2(a), the Legislature only went so far as to impose a reporting requirement on municipal light plants. Specifically, that provision states in relevant part that MassDEP’s regulations shall:

require reporting of greenhouse gas emissions from generation sources producing all electricity consumed, including transmission and distribution line losses from electricity generated within the commonwealth or imported from outside the commonwealth; provided, however, that this requirement shall apply to all retail sellers of electricity, including electric utilities, municipal electric departments and municipal light boards as defined in section 1 of chapter 164A...



G.L. c. 21N, § 2(a)(5) (emphasis added). A reporting requirement is fundamentally different than imposing CES power purchase requirements on municipal light plants that would have substantial cost impacts on their ratepayers. Importantly, M.G.L. c. 21N does not include any other reference or provision applicable to “retail sellers” or municipal light plants. In addition, it is important to note that M.G.L. c. 21N does not contain any language that provides MassDEP with express authority to impose power purchase requirements on municipal light plants.

Notably, the Legislature rejected a bill that would require utilities to purchase a percentage of energy from clean energy generation resources. Specifically, House Bill 3968, an Act relative to clean energy resources, sought to require distribution companies to solicit proposals to purchase no less than 18,900,000 MWh of electricity annually from clean energy generation sources. That bill, however, was not adopted by the Massachusetts House of Representatives. It is clear that the proposed CES regulations are an administrative attempt to ignore the results of the failed bill. Notably, even HB 3968 excluded municipal light plants by limiting the applicability to distribution companies as defined by M.G.L. 164, § 1. Municipal light plants do not constitute distribution companies or electric companies for purposes of G.L. c. 164, § 1. *See* G.L. c. 164, §§ 1, 2; *Howard v. Chicopee*, 299 Mass. 115, 122 (1938).

The lack of express statutory authority to impose a mandatory CES obligation on municipal light plants is significant. Although the absence of an explicit provision is not always conclusive, implied authority to promulgate such regulations still must be established. *See Massachusetts Electric Company v. Department of Public Utilities*, 419 Mass. 239, 246 (1994). Courts give special scrutiny to assertions of implied authority, which cannot be withstood here. *Id.* at 246. Based on the language of M.G.L. c. 21N and an examination of the statutory and regulatory scheme governing municipal light plants, no legislative intent to subject municipal light plants to a mandatory CES obligation and to power purchase obligations can be discerned. *See, e.g., Board of Gas and Electric Commissioners of Middleborough v. Department of Public Utilities*, 363 Mass. 433 (1973). Accordingly, any attempt to subject municipal light plants that have not opened up their service territories to competition to such obligations, exceeds MassDEP’s authority.

Consistent with the statutory and regulatory scheme and the unique position and challenges that municipal light plants face, they should continue to retain the flexibility to structure their own programs in furtherance of the Commonwealth's clean energy goals based on their individual needs and resources. TMLP appreciates the Commonwealth's clean energy goals and would continue to implement measures on a voluntary basis, which it has done. Accordingly, TMLP urges the MassDEP to exclude municipal electric departments and municipal light boards from the mandatory CES requirement. At a minimum, the MassDEP should at least limit the applicability of the CES to those municipal light plants that have opened up their service territories to retail competition pursuant to M.G.L. c. 164, § 47A.

Respectfully submitted,

TAUNTON MUNICIPAL LIGHTING PLANT  
By its attorneys,

A handwritten signature in dark ink, appearing to read "Christopher Pollart", is written over a horizontal line.

Christopher J. Pollart  
Karla J. Doukas  
Rubin and Rudman LLP  
50 Rowes Wharf  
Boston, MA 02110  
(617) 330-7000



November 16, 2016

Ms. Christine Kirby  
Director, Division of Air and Climate Programs  
Massachusetts Department of Environmental Protection  
One Winter Street  
Boston, MA 02180

Director Kirby:

Waste Management is pleased to offer these comments to the Massachusetts Department of Environmental Protection per your recent request for stakeholder input on new greenhouse gas (GHG) regulations.

Waste Management is a leading provider of comprehensive environmental solutions services in North America, serving more than 21 million customers in the U.S. and Canada. We are committed to reducing our carbon footprint, as well as helping our customers do the same. The Carbon Disclosure Project (CDP) just recognized Waste Management as a leader among companies from around the world for the depth and quality of climate change data it discloses to investors and the global marketplace, and for the 13<sup>th</sup> time, we were named to the 2016 Dow Jones Sustainability Index (DJSI). Our commitment to providing sustainable services to customers across the country, and in the state of Massachusetts, result in significant GHG reductions:

#### *Recycling and Organics*

- We are North America's largest residential recycler, managing almost 14 million tons of material that is recycled or reused each year
  - WM owns or operates Material Recovery Facilities (MRFs) in Avon, Billerica and Springfield, MA
- We've developed a network of company-operated compost and organics processing facilities, partners' facilities and third-party operations to manage more than two million tons of organics, converting it to beneficial uses such as mulch, compost and even energy.
  - WM is currently constructing an organics processing facility in the City of Boston which is scheduled for opening in early 2017.

#### *Renewable Energy*

- Landfill gas is currently being supplied to more than 136 projects, providing more than 615 megawatts of energy per year (enough to power nearly half a million homes)
- Energy supplied by landfill gas replaces over two and a half million tons of coal per year
  - In Massachusetts, WM operates several Landfill Gas to Energy (LFGTE) facilities that generate clean renewable energy to the grid.

#### *Converting our Fleet to Natural Gas*

- To date, nearly 6,000 natural gas collection vehicles have been put into operation-making ours the largest heavy-duty natural gas fleet in the country.

- Each natural gas truck eliminates the use of 8,000 gallons of diesel fuel/year, which is replaced with cleaner-burning natural gas or renewable biogas. Natural gas trucks have nearly zero particulate emissions, reduce smog-producing NOx, and reduce GHG emissions by over 20 percent.
  - Our hauling district in Norton, MA includes a CNG fueling station and all collection trucks run on clean natural gas.


As the Commonwealth of Massachusetts looks to continue the progress made in reducing GHG emissions as required by the Global Warming Solutions Act, the 2016 Supreme Judicial Court of Massachusetts ruling, and recent Executive Order from Governor Charlie Baker, we believe one area with potential for considerable reductions is the transportation sector. According to the MA DEP, “GHG Emissions by Sector in 1990 and 2012”, the percentage of GHG emission from mobile combustion increased from 32.3% in 1990 to 41.5% in 2013. During that same period, the percentage of GHG emissions from electricity consumption declined from 29.8% to 21.9%. There may be many reasons for this decline, but it is likely that programs such as the Regional Greenhouse Gas Initiative (RGG) and the state’s Renewable Portfolio Standard (RPS) were two major contributors. To achieve similar GHG reductions from transportation, we suggest one option the DEP should consider is adopting regulations that would lower the carbon intensity of transportation fuels that are utilized in Massachusetts.

One way to achieve such reductions is through a Low Carbon Fuel Standard (LCFS). The LCFS establishes an annual carbon intensity (CI) standard for gasoline, diesel as well as the fuels that may replace them. Regulated entities (fuel refineries, suppliers) would be required to meet annual limits by lowering the CI of the fuel they provide or by purchasing credits from other low carbon fuel generators. California adopted a LCFS in 2009 as part of its goal to reduce the CI of transportation fuel by at least 10% by 2020. In addition to CA, the Pacific Coast Collaboration has been established between British Columbia, Oregon, Washington and California to create a regional program. Currently, British Columbia, Oregon and California have their programs in place.

Should Massachusetts implement a LCFS, it would provide Waste Management with an opportunity to develop new landfill gas to fuel (LFGTF) facilities in the region to produce low-carbon transportation fuel. In the U.S., Waste Management has produced over 12 million ethanol gallon equivalents of renewable natural gas to power approximately 1,000 solid waste and recyclable material collection vehicles daily. Under a LCFS in Massachusetts, our Northeast landfills could be utilized to provide the same type of low carbon transportation fuel, resulting in considerable GHG reductions.

Thank you very much for your consideration of our comments. Waste Management looks forward to continuing to work with the Massachusetts DEP and other stakeholders to achieve its GHG reduction goals. Please do not hesitate to contact me if you have any questions.

Sincerely,



Garrett Trierweiler, Senior Manager – Public Affairs

**From:** Kara T

**Sent:** Wednesday, November 16, 2016 8:51:55 AM (UTC-05:00) Eastern Time (US & Canada)

**To:** Strategies, Climate (DEP)

**Subject:** gas leaks in MA

To Whom It May Concern:

I am writing to express my concern about the number of gas leaks that have gone unattended by the utility companies in Massachusetts.

Recently it has come to my attention that there are at least 177 natural gas leaks in the town of Arlington alone and approximately 20,000 statewide. There are streets in Arlington where one can actually smell the leaking gas.

As you know, these gas leaks pose multiple threats to human health and safety and of course to the environment. Additionally, these leaks are an economic waste for consumers.

For all these reasons, we need strict regulations to ensure that the gas companies fix all gas leaks. Identifying and fixing the largest leaks (the "super-emitters") should happen as soon as possible, but we also want all other gas leaks fixed in a timely manner.

Thanks in advance for your attention to this urgent matter.

Kara Tutunjian

**From:** shirley vieira

**Sent:** Wednesday, November 16, 2016 4:30:49 PM (UTC-05:00) Eastern Time (US & Canada)

**To:** Strategies, Climate (DEP)

**Subject:** Gas leaks

Good Afternoon,

I am writing to express my concern about the number of gas leaks that have gone unattended by the utility companies in Massachusetts.

Recently it has come to my attention that there are at least 177 Natural Gas leaks in the town of Arlington alone and approximately 20,000 statewide. There are streets in Arlington where one can actually smell the leaking gas.

The methane from the Natural Gas leaks is bad for our health, bad for the plant life around us, adds to the warming of the planet and could pose a safety hazard. Also, we, the consumers, are the ones paying for lost and unaccounted for gas.

For all these reasons, we need strict regulations to ensure that the gas companies fix all gas leaks. Identifying and fixing the largest leaks (the "super-emitters") should happen as soon as possible, but we also want all other gas leaks fixed in a timely manner.

Thank you.

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We believe our faith calls us to change the world!

**November 3, 2016**

**To: Department of Environmental Protection**

**Subj: Global Warming Solution Action Hearings,**

**Nov 3, 2016 DEP Office, 8 New Bond Street, Worcester 10 AM - 5 PM**

The Executive Order issued by Governor Baker is an important and welcome first step. We appreciate it. The Governor has reaffirmed that climate change is a serious threat and that the Administration intends to meet the requirements of the GWSA.

That said, the Executive Order is not enough. Right now, we are **not** on track to meet the 2020 emissions reductions mandated by the Global Warming Solutions Act (GWSA). The GWSA targets are not aspirations - they are legally required. The Massachusetts Supreme Judicial Court has ruled that the state has an obligation to put regulations in place that ensure we close the gap and achieve compliance by 2020.

We need specific plans and accurate accounting to ensure that the regulations created by the DEP accomplish the mandated 25% reduction in carbon emissions below 1990 levels by 2020. The current Clean Energy and Climate Plan (CECP) includes many key policies/programs intended to achieve compliance, but we are lagging in meeting 2020 targets and in implementing many of the measures contained in the plan.

Similarly, the new clean energy procurements of hydropower and offshore wind included in the 2016 Comprehensive Energy omnibus bill are critical to helping MA transition to clean energy over the coming decades. But because those resources will not come online until after 2020, they will not help us meet the GWSA requirements.

UU Mass Action, in coalition with our partners in the MA Power Forward, identified the following area where opportunities exist to achieve deeper reductions in the immediate term:

**Gas leaks:** Repair the distribution system and stop all leaks. The Department of Environmental Protection should issue regulations that extend beyond 2020 on methane emissions to ensure continued reduction. DEP should also partner with independent researchers to help define “leaks of significant environmental impact.”

**New gas infrastructure:** The administration should factor GWSA impacts into decision making related to new generation facilities and pipelines. Continuing to pursue new gas infrastructure is at odds with our need to comply with the GWSA.

**Carbon pollution fee-and-rebate:** A study done for DOER in 2014 demonstrated that it is feasible to implement a carbon pricing system in Massachusetts, and that if most or all of the revenues are returned to the public through rebates, there will be positive economic impacts on the state as a whole, on low- and moderate-income households, and on a large majority of business sectors. This policy would require legislation, and would only be in operation for a couple of years by 2020, thus limiting its impact, but it could yield reductions of several hundred thousand MMTCO<sub>2</sub>e in 2020

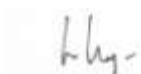
**Energy Efficiency:** we’ve made great gains with EE, but we could be doing much more, in ways that would be much less expensive than building out new gas infrastructure. Right now, the utilities are *not* doing everything they could be doing in regards to energy efficiency. The utilities should be required to capture all efficiency and demand reduction resources that are cost-effective or less expensive than new supply. The administration could push the utilities through a number of channels, including DOER and the Energy Efficiency Advisory Council (EEAC).

Make **municipal utilities** comply with the Renewable Portfolio Standards and the energy efficiency requirements that apply to other utilities.

**Clean Energy Standard** – consider a Clean Energy Standard that is specifically tailored to promote clean energy solutions. For instance, a Clean Energy Standard could incentivize storage, the adoption of renewables beyond what is currently required by RPS, and/or the use of energy efficiency above and beyond existing three-year-plan goals.

**Transportation:** There are a number of steps that would reduce transportation emissions, most of which fall under the purview of the Department of Transportation. Possibilities include: pay-as-you-drive insurance (a pilot program on this was recently dropped), encouraging municipalities and Regional Transit Authorities to purchase EVs, creating EV charging stations, adjusting the sales tax for new car purchases based on fuel efficiency, and driver education programs.

Sincerely,



Laura Wagner LICSW, Executive Director



November 21, 2016

Jordan Garfinkle  
Environmental Analyst  
Department of Environmental Protection  
One Winter Street 7th Floor  
Boston, MA 02108

Re: Eversource Comments on Global Warming Solutions Act Regulations

Dear Mr. Garfinkle:

Eversource Energy Service Company, on behalf of NSTAR Electric Company d/b/a Eversource Energy ("NSTAR Electric"), NSTAR Gas Company d/b/a Eversource Energy ("NSTAR Gas") and Western Massachusetts Electric Company d/b/a Eversource Energy ("WMECO"), (collectively "Eversource"), submits this comment letter to the Massachusetts Department of Environmental Protection ("DEP") in response to the request for comments from stakeholders on the DEP's proposed Global Warming Solutions Act ("GWSA") regulations. Eversource operates New England's largest utility system serving more than 3.6 million electric and natural gas customers in Connecticut, Massachusetts and New Hampshire. In order to meet its obligations to provide vital public services, Eversource ensures system reliability and safety standards are maintained in compliance with national, regional, and industry standards and policies.

Eversource values clean energy as an important part of the energy mix in New England, while ensuring costs to ratepayers remain reasonable and fair. We are committed to serving as a clean energy catalyst in the region, developing Northern Pass to tap into clean hydropower, and pursuing company-owned solar, storage and electric vehicle infrastructure. We also are committed to environmental protection and stewardship, and compliance with federal, state, and local environmental rules.

Our comments will address the following issues:

- Clean Energy Standard
- Effective date and level of standard
- Alternate compliance payments
- Inclusiveness of municipalities
- Resource eligibility

*Clean Energy Standard:*

Eversource supports regulations that will be successful in meeting the standards set forth in the GWSA by reducing emissions to the Commonwealth at the lowest cost for customers. We recognize that the Clean Energy Standard ("CES"), as originally proposed in 2014, intended to create long-term incentives to support clean energy in the region. Since the CES was originally proposed, legislative mandates 83C and 83D have been passed, requiring 1600 MW of offshore wind and 9.45 TWh of clean energy into the Commonwealth. These two mandates alone will allow for 32

percent of the Commonwealth's retail distribution load<sup>1</sup> to be from sources of clean energy. Coupled with the knowledge that the electric sector has already reduced its CO<sub>2</sub> emissions by over 50% (see *Effective date of Clean Energy Standard and Level of Annual Standards*, below), Eversource believes that implementing a CES is not needed and would not be in the best interests of customers.

As noted in Table 1, below, existing clean energy programs already have strong financial support and represent a significant investment for customers of investor owned utilities all over the Commonwealth. Eversource anticipates that adoption of a CES would result in additional substantial retail energy cost increases to customers that already face some of the highest energy costs in the nation.

Eversource estimated the level of expenditure by Massachusetts customers for clean energy over the cost of conventional generation as follows:

**Table 1: Estimated Annual Massachusetts Clean Energy Costs**

\$M	2014	2016	2018	2020
Solar RPS	137	469	756	711
New Solar Incentive Program	-	-	210	390
Existing Long-Term Contracts	6	46	119	141
83D Legislative Mandate	-	-	-	250
83C Legislative Mandate	-	-	-	unknown
Clean Energy RFP	-	-	-	11
Other RPS/APS	288	254	190	225
Net Metering	48	128	259	269
<b>Total</b>	<b>480</b>	<b>897</b>	<b>1,534</b>	<b>1,997</b>

Moreover, the proposed CES is duplicative and ill-conceived as it is substantially based on the designs of several existing Renewable and Alternative Portfolio Standards ("RPS" and "APS"). Existing portfolio standards have not been effective instruments for supporting sustained development of new resources at competitive prices:

- Almost half of the 2014 Massachusetts APS obligation and nearly a third of the RPS Class II obligation were met through alternative compliance payments ("ACP") rather than generation purchases.<sup>2</sup>
- Maintaining growth of RPS Class I supply has required passage of Section 83 and 83A of the Green Communities Act in order to facilitate the financing of new resources. More recently, Sections 83C and 83D were passed requiring Massachusetts Electric Distribution Companies, including NSTAR Electric and WMECO, to continue to make significant contractual commitments to renewable energy projects that are still under development and have yet to be reflected in customer bills.
- Support of solar development through the RPS Class I carve-outs has required Massachusetts customers to pay substantially higher prices than those in other states. The Solar Carve-Out I program includes a target

<sup>1</sup> 2015 retail electricity sales, Massachusetts Department of Energy Resources.

<sup>2</sup> *Massachusetts RPS & APS Annual Compliance Report for 2014*, Massachusetts Department of Energy Resources, May 2016.

floor price of \$285/SREC, and 2016 SREC prices are presently trading in excess of \$380/SREC. By contrast, Connecticut customers are supporting equivalent solar resources at \$85/REC through the ZREC program.

Based on these observations, Eversource strongly discourages DEP from adopting an additional portfolio standard at this time. Eversource expects such a measure would result, at best, in only modest changes to the region's generation mix, while ensuring that Massachusetts customers incur significant additional retail energy cost increases to cover high certificate premiums and/or ACP. Eversource instead encourages the DEP to work collaboratively with other agencies and stakeholders to develop competitive, cost-effective solutions to the considerable energy challenges facing Massachusetts and New England.

However, should a CES be adopted, Eversource submits the following comments to the specific questions posed by DEP:

*Effective date of Clean Energy Standard and Level of Annual Standards*

The 1990 baseline of CO<sub>2</sub> for electric generation is 25.6 MMTCO<sub>2</sub>e<sup>3</sup>. In 2013, DEP reported that emissions from the electric sector were 12.48 MMTCO<sub>2</sub>e<sup>4</sup>, which represents over a 50 percent decline from 1990 - double the 25 percent reduction by 2020 called for in the GWSA. Given the significant reductions that have already been achieved in the electric sector, the DEP should postpone the implementation of any regulatory requirement that imposes additional costs to Massachusetts customers unless and until it is demonstrated that the electric sector is at risk of non-compliance with its fair share of the goals set forth in the GWSA.

*ACP rate*

In the event that the DEP proposes to implement an ACP rate in future CES regulations, it should carefully consider the following when setting the ACP rate. The ACP rate should be set with the recognition that clean energy sources that are also renewable are eligible to receive payments for their credits in the market. Eversource expects that new resources that are not presently RPS eligible may require very modest, if any, premium support, particularly if those payments are made under a predictable market design.

*Municipalities*

Any regulation that implements a CES should apply to all energy suppliers, including municipal electric companies. Clean energy goals benefit all Massachusetts residents, and the costs incurred to achieve those goals should be borne equally by electric customers, regardless of whether they are served by an investor owned utility or a municipal electric company. Given the importance of these goals and the significant costs and efforts needed to achieve them, no entity should be exempt from compliance with DEP's regulations.

*Resource eligibility*

Eversource supports regulations that will be successful in reducing greenhouse gas emissions in a meaningful way at the lowest cost for Massachusetts customers. Recognizing that the electric sector has already achieved double the

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<sup>3</sup> *Statewide Greenhouse Gas Emissions Level: 1990 Baseline and 2020 Business as Usual Projection*, Massachusetts Department of Environmental Protection, July 2009.

<sup>4</sup> *GWSA Regulations – Emitting Electricity Generators Stateholder Meeting*, Massachusetts Department of Environmental Protection, November 2016.

carbon reduction called for by 2020 in the GWSA (see "Effective date of Clean Energy Standard and Level of Standards", above), if a CES was adopted, the best way to continue to achieve and exceed carbon reduction goals would be to allow all non- or low-emitting resources to qualify for Clean Energy Certificates ("CEC") and not limit the program to new resources.

Eversource thanks DEP for its careful consideration of these comments and looks forward to continuing to work with DEP and other stakeholders to develop competitive, cost-effective solutions for meeting the Commonwealth's important energy and environmental goals.

Should you have any comments or questions, please contact Katherine Wilson, 781-441-3789.

Sincerely,

A handwritten signature in dark ink, appearing to read "Jeffery S. Waltman", followed by a long horizontal flourish line extending to the right.

Jeffery S. Waltman

Manager, Planning and Power Supply

Dynegy Inc.  
601 Travis Street, Suite 1400  
Houston, Texas 77002  
Phone 713.507.6400  
www.dynegy.com



November 21, 2016

Via email: [climate.strategies@state.ma.us](mailto:climate.strategies@state.ma.us)

**RE: Dynegy Inc. Comments on the Stakeholder Discussion Draft of the Reducing Greenhouse Gas Emissions from the Electricity Generating Facilities Program and the Clean Energy Standard Discussion Document**

Dear Sir or Madam:

Dynegy Inc. welcomes the opportunity to submit the following comments regarding the Massachusetts Department of Environmental Protection stakeholder discussion draft of the Reducing Greenhouse Gas Emissions from the Electricity Generating Facilities Program and the Clean Energy Standard discussion document. We appreciate the agency's consideration of our comments. If you have any questions concerning Dynegy's comments, please contact me at 713-767-5212 or at [Bruce.Wilcoxon@dynegy.com](mailto:Bruce.Wilcoxon@dynegy.com).

Sincerely,

Bruce Wilcoxon  
Environmental Affairs Director

## **Dynegy in Massachusetts**

Dynegy is the fourth largest independent power producer in the United States with an asset portfolio consisting of nearly 26,000 megawatts (MW) of generating capacity, capable of generating enough electricity to power about 21 million homes nationwide. Importantly Dynegy is currently one of the largest producers of electricity in Massachusetts operating three power plants with a combined generating capacity of nearly 2,000 MW and responsible for delivering nearly 15% of electricity generated in-state in 2014. In June of 2017 Dynegy will be closing its Brayton Point power plant, the last coal-fueled facility in the Commonwealth. However, the company is also in the final stages of a deal to acquire the U.S. fossil fuel generation fleet of ENGIE (formerly GDF Suez). That deal is expected to close in the fourth quarter of 2016 and when it does Dynegy will add four additional natural gas combined cycle facilities to its Massachusetts fleet. The transaction will make Dynegy the largest generator in the state, operating only efficient, lower-emission combined cycle natural gas units and improving the greenhouse gas (GHG) intensity of our production by nearly 50%.

## **Impact of the Proposed GHG Emission Cap**

Given our current and future commitment to the Commonwealth we take very seriously any policy developments with the potential to have a significant material impact on our business in the state. DEP's proposed cap on GHG emissions from the state's electricity generating units falls into this category. Comparing the 2015 GHG emissions from the six facilities Dynegy will own and operate in Massachusetts to the proposed 2018 unit-specific emission limits on those facilities, the company will need to reduce GHG emissions by 18% or acquire the over-compliance credits (OCC) necessary to cover any emissions in excess of those plant limits. Carrying the proposed 2.5% per annum reduction in the emission cap out to 2030 will require an almost 40% reduction in GHG emissions from the fleet. To put that reduction in context, that would be the equivalent of approximately 900 MW of combined-cycle generating capacity leaving the state by 2030.

Dynegy has initiated a quantitative assessment of the potential impacts of a Massachusetts-only emission cap on our in-state fleet. Assuming generators are able to recover the cost of carbon through energy prices, our high level dispatch modeling suggests that gas-fueled generation from adjacent states would displace generation from Dynegy's Massachusetts plants – resulting in lower capacity factors. Further, adoption of a Massachusetts-only carbon scheme should result in higher regional energy prices. We are committed to sharing the results of our modeling throughout DEP's proposed rulemaking process.

## **Key Messages**

Given the importance of this potential rulemaking for Dynegy we respectfully offer the following key messages for DEP to consider as the agency works to develop the regulatory language prior to noticing this regulation for a formal public comment process.

1. Imposing a *state-specific* emission cap on generators operating within a competitive *regional* power will likely result in the unintended consequences of shifting generation out of state without reducing regional GHG emissions while jeopardizing the ISO-NE electricity system reliability and increasing costs to Massachusetts consumers.
2. The Massachusetts power sector has already reduced GHG emissions 60% below 1990 levels, well beyond levels asked for and achieved by other emitting sectors and DEP should include these equity considerations in its approach to implementing the court-mandated provisions of the Global Warming Solutions Act (GWSA).
3. Any new policy capping GHG emissions from the state power sector should include compliance flexibility mechanisms that allow generators to effectively manage the competing interests of delivering energy and reducing GHG emissions.
4. Existing and new sources must be treated equitably under any new carbon policy.
5. The proposed Clean Energy Standard is unnecessary given the existing mandates and policies in place to support cleaner energy development in the Commonwealth.

### **Massachusetts Power Sector Emission Limits in a Regional Electricity market**

Dynegy Position: State-specific emission limits on power plants competing in a competitive regional electricity market represent ineffective environmental and energy policy and will likely have significant unintended consequences for consumers and the environment.

Rationale: The proposed Massachusetts-only power sector emission cap may have the unintended consequences of decreasing system reliability and increasing consumer prices without impacting regional GHG emissions. Initial modeling indicates that any reduction in generation from the Massachusetts power sector to comply with the proposed emission limits will result in shifting generation to existing facilities outside the state.

*Reliability* – Under the proposed regulation, outages of non-fossil fuel units in New England or higher loads early in a given year may result in Massachusetts fossil fuel generators reaching their allowed operational limit before the end of the year. This could lead to widespread outages of fossil fuel generators toward the end of the year in a state that in 2015 met just 50% of its electricity demand with in-state generation<sup>1</sup>. Further, Massachusetts is projected to account for 46% of New England's electricity demand in 2018, but in-state fossil generation will be limited by the proposed emission cap to providing approximately 19 GWHs or just 13% of the total ISO-NE demand<sup>2</sup>. Also, natural gas fueled generators provide the fast-ramping and highly flexible operation that is required to balance customer's

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<sup>1</sup> See EIA Net Generation by State (<http://www.eia.gov/electricity/data/state/>) and ISO-NE Forecast Data 2016 (<https://www.iso-ne.com/system-planning/system-forecasting/load-forecast>)

<sup>2</sup> ISO-NE Forecast Data 2016 (<https://www.iso-ne.com/system-planning/system-forecasting/load-forecast>) and assuming 941lbs CO2 per MWH production

changing load demand, along with balancing the intermittency of wind and solar energy. Finally, conventional generators are required to provide needed voltage support and transmission security to the power grid. This operation could deplete their allowances and make them unavailable at a time when they would be needed by ISO-NE.

*Consumer impact* – Compliance with the DEP proposed emission limits will make Massachusetts generation more expensive and the shift to generation outside the state that is not currently being dispatched due to economics will translate the incremental cost of the DEP policy to consumers around the region. Eventually the proposed emission cap could cause Massachusetts plants to close prematurely transferring local jobs and property tax revenues to adjacent states.

*Regional GHG emissions* – Shifting generation to existing facilities outside the state may result in no net reduction in regional GHG emissions. Further, if that out-of-state generation is less efficient as one would predict in a system based on economic dispatch, the proposed DEP policy could result in a net *increase* in regional GHG emissions.

Recommendations: MA DEP should conduct a thorough and holistic quantitative analysis of any proposed rule in time to influence specific provisions of the final rule to understand the impact of the proposed MA GHG emission limits on regional GHG emission trends grid reliability and the Massachusetts consumers.

## **Power Sector Historic Contribution to Massachusetts GHG Reduction**

Dynegy Position: The power sector has already made a significant contribution to GHG reduction in Commonwealth and remains the only sector regulated for GHG emissions in the region. Therefore, near-term reduction requirements should be tempered in light of this contribution and the potential unintended consequences described above

Rationale: The GHG reduction from the state power sector since 1990 is well documented and widely known. Since 1990 Massachusetts power sector GHG emissions have fallen by 60% whereas emissions from other sectors such as transportation have remained essentially flat. Part of that reduction has due to the Regional Greenhouse Gas Initiative cap on power sector emissions, due to become more stringent starting in 2020.

While Section 3(c) of the GWSA requires the DEP to establish “emission levels and limits associated with the electric sector” and Section 3(d) requires DEP to establish “a desired level of declining annual aggregate emission limits for sources or categories of sources”, the DEP is presumably afforded considerable latitude regarding the *specific* emission limits for the sector and the rate of annual decline.

Recommendations:

- DEP should reevaluate the contribution the state power sector can and should be asked to make towards the state’s 2020 GHG reduction goal and consider raising the emission cap and reducing the annual reduction to 2020.



- For example, the DEP may consider establishing the 2018 sector emission cap based on the highest in-state annual GHG emissions between 2012 and 2015 and then setting the 2019 and 2020 annual reductions to bring the sector in line with emissions from the lowest level of annual production during that period.
- The DEP should codify a review process following each GWSA interim milestone (e.g. 2020, 2030) with the aim of establishing both the interim emission limit and the reasonable and equitable contributions each sector of the state should make towards those goals.

## **Cap-and-Trade Compliance Flexibility Mechanisms**

Dynegy Position: DEP should include a range of compliance flexibility mechanisms within the final sector carbon regulation to help Massachusetts generators meet the competing requirements of DEP's proposed GHG cap-and-trade system and the obligations to operate within ISO-NE.

Rationale: Without clearly stating the intent, the DEP proposal would create a cap-and-trade system to guarantee the desired level of emission reduction from the state's power sector. The proposal to allow trading on over-compliance credits (OCC) generated when covered sources emit GHG below their mandated limits will provide only limited compliance flexibility for generators seeking to comply with state GHG regulations and ISO-NE performance obligations. In particular, because this mechanism is only for Massachusetts power plants there will be a small, illiquid pool from which OCCs may be bought and sold. As listed by DEP, there are only 22 existing facilities that will be participating. Based on the small pool, it is therefore unlikely that credits will be traded at a volume necessary to drive efficient price discovery.

Recommendation: Fortunately there is now a wealth of experience designing efficient emission trading systems and we urge the DEP to tap into that experience when developing the compliance system necessary to meet any sector emission reduction limits dictated by the GWSA. The DEP need go no further than the Regional Greenhouse Gas Initiative (RGGI) for examples of flexibility provisions that allow the sector to accommodate the dynamic nature of the energy market. In particular, a system that limits sector rather than unit emissions, that distributes emission allowances via quarterly allowance auctions, that sets multi-year compliance periods and that allows for banking of compliance instruments provides generators their needed flexibility.

## **Treatment of New Generation Sources**

Dynegy Position: The regulatory framework described in the stakeholder discussion draft does not provide an equitable approach to integrating new, efficient generation resources into the state.

Rationale: The proposed 1MMT set aside for new generation resources does not cover the three new resources that have cleared in recent ISO New England Forward Capacity Auctions and have Capacity Supply Obligations that begin for one generator on June 1, 2017 and for the two others on June 1, 2019. These resources constitute an aggregate capacity of 1,197 MWs. The proposed set aside for these

resources is not likely to be sufficient cover an aggregate capacity of that amount. For instance, in 2015 the ANP Blackstone and Bellingham facilities, with a combined capacity of 1,110 MW and operating at about 50% capacity factor generated about 1.8 million metric tons of CO<sub>2</sub>. Further, capping new resources separately from existing may have the perverse incentive of favoring older, less-efficient facilities over newer, more-efficient generation.

Recommendation: DEP should adopt a power sector emission limit/reduction schedule rather than limits on specific existing facilities and a set aside for new generation. Various options are available for distributing the emission rights created by a sector cap, however the most efficient and equitable approach would be to conduct period allowance auctions. Such an approach would create a true market for allowances, would increase compliance flexibility, and would provide all generators an equal chance to obtain the allowances necessary for compliance and continued operation.

### **Proposed Clean Energy Standard**

Dynegy Position: The proposed Clean Energy Standard is not mandated and is unnecessary given the range of federal, regional and state policies aimed at incentivizing the development of cleaner energy in the state.

Rationale: Nothing in the in the GWSA or *Kain* decision compels the DEP to implement the proposed Clean Energy Standard. Further, the DEP does not demonstrate the need for another layer of energy sector regulation on top of the state policies aimed at incentivizing the delivery of additional clean energy to the state (e.g. RPS, mandates for clean energy imports and offshore wind). In addition, renewable and cleaner energy resources already benefit directly from federal tax incentives for wind and solar production and indirectly from a price on carbon imbedded in fossil fuel generation bidding to account for RGGI compliance.

Recommendation: DEP should not continue to pursue the development the proposed Clean Energy Standard.

11/7/2016

Redline comments from the Environmental League of Massachusetts

November 21, 2016

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***This stakeholder discussion draft is being provided at this time for the sole purpose of soliciting stakeholder input prior to the development of regulations. Key policy and technical issues are identified within the document. If MassDEP proceeds with this proposed regulation, comments on this discussion draft will be considered in developing regulatory language prior to noticing this regulation for a formal public comment process required by Massachusetts General Law Chapter 30A.***

310 CMR 7.77 Reducing Greenhouse Gas (GHG) Emissions From Electricity Generating Facilities Program

(1) Purpose and Scope. The purpose of 310 CMR 7.77 is to limit and reduce GHG emissions, pursuant to the Climate Protection and Green Economy Act, adopted at M.G.L. c. 21N, by establishing a cap on the amount of GHG emissions that may be emitted from the largest electricity generating facilities in Massachusetts. 310 CMR 7.77 accomplishes this by establishing GHG emissions caps for each facility subject to 310 CMR 7.77 and reducing the amount of the GHG emissions caps by ~~2.5~~5.0% on an annual basis.

**Commented [EW1]:** With little or no chance for federal climate change policies to be enacted in the foreseeable future, it is imperative that states do as much as possible to address global warming. Therefore, throughout this proposal, the caps should be reduced by 5.0% per year, not 2.5%. This will also potentially make these regulations consistent with current direction of the RGGI revisions.

(2) Definitions. The terms used in 310 CMR 7.77: *Reducing GHG Emissions from Stationary Facilities* are defined in 310 CMR 7.77(2) and in 310 CMR 7.00: *Definitions*. Where a term is defined in 310 CMR 7.00: *Definitions* and in 310 CMR 7.77, the definition in 310 CMR 7.77 shall apply.

Actual GHG Emissions means GHG emissions reported to EPA's GHG reporting program. GHG emissions reported to EPA's GHG reporting program are adjusted for the different heat-trapping potential of different gases and expressed in metric tons.

Aggregate GHG Emissions Cap means the maximum aggregate allowable level of GHG that may be emitted from all facilities subject to 310 CMR 7.77, inclusive of new and existing facilities.

Calendar Year means January 1 through December 31.

Commence Commercial Operation means when a facility generates electricity for sale or use, including the sale of test generation.

Designated Representative means the person who has been authorized by the owner or operator of the facility to represent and legally bind the owner or operator in matters pertaining to the 310 CMR 7.77.

Electric Generating Facility, as defined in 40 CFR 98.40, means

**Commented [EW2]:** ELM is concerned that federal regulations may change dramatically in the near future given the incoming administrations public stance on climate change. Therefore, in order to prevent confusion and ensure that these draft rules survive in the event that there are significant changes to federal regulations, DEP should consider additional language that, provides an alternative, Massachusetts-based, definitions. One suggestion is to reference federal rules that as they are written as of a specific date, such as November 1, 2016. This comment applies to all references to 40 CFR 98 et seq.

- (a) Electricity generating units that are subject to the requirements of the Acid Rain Program and any other electricity generating units that are required to monitor and report to EPA CO<sub>2</sub> mass emissions year-round according to 40 CFR part 75.

**Commented [e3]:** See comment about referencing federal regulations above.

**Commented [e4]:** See comment about referencing federal regulations above.

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(b) This source category does not include portable equipment, emergency equipment, or emergency generators, as defined in 40 CFR 98.6.

EPA's GHG Reporting Program means the program the EPA adopted at 40 CFR 98 that requires reporting of annual GHG emissions from facilities greater than 25,000 tons per year of GHG.

Excess GHG Emissions means, for a particular year, the difference between the facility's actual GHG emissions and the facility's GHG emissions cap, provided this difference is greater than zero.

Existing Facility means a facility that is subject to EPA's GHG reporting program as an electricity generating facility, 40 CFR 98 subpart D, and/or is listed in 310 CMR 7.77(4)(b) Table A.

Facility means any physical property, plant, building, structure, source or stationary equipment located on contiguous or adjacent property that emits or may emit any GHG and is subject to GHG emissions reporting pursuant to 40 CFR Part 98.

GHG Emissions Cap means the maximum allowable amount of GHG emissions that a facility may emit in a calendar year without using over compliance credits.

Greenhouse Gas or GHG means carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons and sulfur hexafluoride.

New Facility Aggregate GHG Emissions Cap means the maximum allowable level of GHG that may be emitted from new facilities.

New Facility means a facility that is an electricity generating facility that emits greater than 25,000 tons of CO<sub>2</sub>e, and is not listed in 310 CMR 7.77(4)(b) Table A.

Operator means any person who operates, controls, or supervises a facility including, but not limited to, any holding company, utility system, plant manager, operations manager of the facility.

Over-Compliance Credit or OCC means credits accrued on the amount of GHG emission reductions below the facility's annual GHG emissions cap or the amount of the new facility aggregate GHG emissions cap that is not assigned to new facilities.

Over-Compliance Credit Registry or OCC Registry means the database that keeps track of the OCCs created and retained by a facility, including serial numbers, and used for compliance. The Department may allow the use of the OCC Registry for other purposes, such as identifying OCCs that may be available for use by other facilities or tracking OCC transfers.

Owner means any of the following persons:

- (a) Any holder of any portion of the legal or equitable title in a facility; or
- (b) Any holder of a leasehold interest in a facility.

Serial Number means, when referring to OCCs, the unique identification number assigned by the Department to each OCC.

**Commented [e5]:** See comment about referencing federal regulations above.

**Commented [e6]:** See comment about referencing federal regulations above.

**Commented [e7]:** See comment about referencing federal regulations above.

**Commented [e8]:** See comment about referencing federal regulations above.

**Commented [e9]:** See comment about referencing federal regulations above.

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(3) Applicability. 310 CMR 7.77 applies to any owner or operator of a facility that that is subject to EPA's GHG Reporting Program as an electricity generating facility, 40 CFR Part 98 Subpart D, for a particular calendar year.

**Commented [e10]:** See comment about referencing federal regulations above.

(4) GHG Emissions Caps.

[NOTE: MASSDEP REQUESTS COMMENT ON ALL ASPECTS OF CAP-SETTING, INCLUDING HOW TO SET STATEWIDE CAPS AND INDIVIDUAL FACILITY CAPS. IN PARTICULAR, MASSDEP REQUESTS COMMENT ON WHETHER IT IS NECESSARY TO SET CAPS FOR NEW FACILITIES OR WHETHER OVER COMPLIANCE CREDITS FROM OTHER FACILITIES SHOULD BE REQUIRED FOR NEW FACILITIES .]

**Commented [EW11]:** Caps should be set for new facilities. If generators are allowed to rely only on OCCs from existing facilities, there may be an incentive not to build new facilities in Massachusetts and instead build them in an adjacent site without any caps (save RGGI). This is a leakage issue. When older units are facing retirement, it is generally better to have them retire and be replaced by a newer more efficient and less polluting unit. If no new caps are provided for new units, it is unlikely that new units will be built and replace the older dirty fleet.

(a) Aggregate GHG Emissions Cap. The annual aggregate GHG emissions cap shall be the sum of the GHG emissions caps listed in 310 CMR 7.77(4)(b) Table A and the new facility aggregate GHG emissions cap, and shall be equal to the following:

1. For calendar year 2018, the aggregate GHG emissions cap shall be 9,119,126 tons of GHG emissions.
2. For each subsequent calendar year, the aggregate GHG emissions cap shall decline by 2.55.0 % of the 2018 aggregate GHG emissions cap each year until 2050.

(b) GHG Emissions Caps for Existing Facilities for 2018. For calendar year 2018, the owner or operator of an existing facility subject to 310 CMR 7.77 shall not cause the facility to emit GHG in excess of the facility's GHG emissions cap listed in 310 CMR 7.77(4)(b) Table A.

**310 CMR 7.77(4)(b) Table A**  
**Facilities and GHG Emissions Caps in Metric Tons**

Facility Name	2018
ANP Bellingham Energy Company, LLC	868,974
ANP Blackstone Energy Company, LLC	758,723
Bellingham	265,478
Berkshire Power	434,503
Brayton Point	0
Canal Station	200,157
Cleary Flood	79,907
Dartmouth Power	58,086
Deer Island Treatment	5,821
Dighton	343,757
Fore River Energy Center	1,436,122
Kendall Square	609,597
MASSPOWER	336,828
Medway Station	7,624
Milford Power, LLC	163,849
Millennium Power Partners	654,771
Mystic	1,582,110

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Pittsfield Generating	101,134
Potter	34,261
Stony Brook	98,092
Tanner Street Generation	44,426
Waters River	6,959
West Springfield	27,945

(c) GHG Emission Caps for Existing Facilities for 2019 and Subsequent Years. Starting in 2019, and for each subsequent calendar year thereafter until 2050, each GHG emissions cap listed in 310 CMR 7.77(4)(b) Table A shall decline by ~~2.55.0~~% of its 2018 value.

(d) New Facility Aggregate GHG Emissions Cap.

1. The new facility aggregate GHG emissions cap for 2018 shall be 1 million metric tons and shall decline by ~~2.55.0~~% of 1 million metric tons each subsequent calendar year until 2050.
2. The Department shall assign GHG emissions caps to new facilities in accordance with the process specified in 310 CMR 7.77 (4)(e).
3. The new facility aggregate GHG emissions cap shall be reduced each year by the amount of the GHG emission caps assigned to new facilities, provided that the sum of GHG emissions caps assigned pursuant to 310 CMR 7.77(4)(e) for any year may not exceed the new facility aggregate GHG emission cap for that year.
4. If the process specified in 310 CMR 7.77(4)(e) would otherwise lead to the assignment of GHG emissions caps to new facilities that exceeds the new facility aggregate GHG emissions cap for a particular year, the Department shall proportionally adjust each new facility's GHG emissions cap downward pursuant to the adjustment process specified in 310 CMR 7.77(4)(e)4.a. to ensure compliance with 310 CMR 7.77(4)(a).

(e) New Facilities GHG Emission Caps. After a new facility commences commercial operation and emits greater than 25,000 tons of CO<sub>2</sub>e, it shall submit a GHG emissions report pursuant to 310 CMR 7.77(6). Based on the information in the GHG emissions report, the Department shall assign a GHG emissions cap to the newly subject facility in accordance with the following process:

1. For the first, second, and third years after the new facility commences commercial operation, the new facility's cap for each year shall be equal to its actual GHG emissions reported for that year under 310 CMR 7.77(6), except as provided in 310 CMR 7.77(4)(e)4.a.
2. Prior to January 1 of the fourth year after the new facility commences commercial operation, the Department shall assign the new facility a GHG emissions cap that is equal to 0.925 times the facility's average emissions over the first two years that the facility is subject to 310 CMR 7.77.
3. Once the Department assigns a new facility's GHG emissions cap pursuant to 310 CMR 7.77(4)(e)2., the GHG emissions cap shall then decline annually until 2050 by ~~2.55.0~~% of the assigned GHG emissions cap times the ratio of the 2018 new facility

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aggregate GHG emissions cap to the new facility aggregate GHG emissions cap for the year for which the GHG emissions cap was assigned pursuant to 310 CMR 7.77(e)2. On a case-by-case basis, the Department may use the process specified in 310 CMR 7.77(4)(e) to address GHG emissions from new emission units at existing facilities by revising the existing facility's GHG emissions cap.

4. By May 1, 2019, and each calendar year thereafter, the Department shall determine the sum of the GHG emissions caps assigned to new facilities pursuant to 310 CMR 7.77(e), including new facilities GHG emissions caps assigned in that year and prior years under 310 CMR 7.77(4)(e), and if the total of the GHG emissions caps does not equal the aggregate new facility GHG emission cap, the Department shall make one of the following adjustments:

- a. If the sum of the GHG emissions caps exceeds the new facility aggregate cap in any year, the Department shall adjust all GHG emissions caps assigned pursuant to 310 CMR 7.77(4)(e) downward by the same percentage, as necessary, to avoid exceeding the new facility aggregate GHG emissions cap, and such new facilities may comply with their GHG emissions caps using OCCs created in accordance with 310 CMR 7.77(5).
- b. If the sum of the GHG emissions caps is less than the new facility aggregate cap in any year, the Department shall create OCCs in an amount equal to the difference between the sum of the GHG emissions caps and the aggregate new facility emissions cap, and shall deposit the OCCs in the OCC registry accounts of the existing facilities listed in 310 CMR 7.77(4)(b) Table A in proportion to their GHG emissions caps.

[MASSDEP SEEKS COMMENT ON THE PROCESS FOR FINALIZING NEW FACILITY CAPS, INCLUDING THE SCHEDULE AND CRITERIA FOR IDENTIFYING NEW FACILITIES AND ESTABLISHING LEGALLY BINDING CAPS.]

(f) Facilities that are No Longer Subject to 40 CFR Part 98. After a facility that has been subject to 310 CMR 7.77 is no longer subject to 40 CFR Part 98 for a particular calendar year, the Department shall create an amount of over compliance credits equal to that facility's GHG emissions cap and deposit them in the remaining facilities' OCC registry accounts in the following priority order:

1. First, to new facilities to increase any GHG emissions caps that were adjusted downward pursuant to 310 CMR 7.77(4)(e)4.a. to avoid exceeding the new facility aggregate GHG emissions cap.
2. Second, to existing facilities listed in 310 CMR 7.77(4)(b) Table A in proportion to their GHG emissions caps.

(g) Compliance Using Over Compliance Credits (OCCs). The owner or operator of a facility shall not emit GHG emissions in excess of its assigned GHG emissions cap for each year unless the owner or operator offsets the excess GHG emissions with OCCs created under 310 CMR 7.77(5).

**Commented [e12]:** See comment about referencing federal regulations above.

(5) Over Compliance Credits (OCCs).

[NOTE: MASSDEP REQUESTS COMMENT ON WHETHER OVER COMPLIANCE CREDITS WILL PROVIDE FOR SUFFICIENT OPERATIONAL FLEXIBILITY, AND WHETHER THE MECHANISM DESCRIBED IN THIS DRAFT REGULATION WILL BE WORKABLE FOR FACILITIES AND MASSDEP.]

(a) Creating Over Compliance Credits.

1. The owner or operator of a facility may create OCCs if the facility's actual GHG emissions are less than its GHG emission cap. The OCCs shall equal the difference between the facility's actual GHG emissions and the facility's GHG emissions cap for that calendar year.
2. In order to use the OCCs for compliance with 310 CMR 7.77(7) or transfer the OCCs to another facility, by May 1, 2019, and each year thereafter, the owner or operator of the facility shall submit a certification to the Department verifying the number of OCCs the facility created in the previous calendar year.
3. The certification shall contain the facility's GHG emission cap for the previous calendar year, the facility's actual GHG emissions from the previous year as reported in EPA's GHG reporting program, a request to establish an account in the OCC registry and the certification statement in 310 CMR 7.77(9)(c) signed by the facility's designated representative.
4. Upon receipt of the certification, the Department shall create an account in the OCC registry for the facility and deposit into the facility's OCC account the number of OCCs created in the previous year. The Department shall assign each OCC an individual serial number.

**Commented [e13]:** See comment about referencing federal regulations above.

**Commented [e14]:** ELM believes this section should be modified to include a review and approval by MA DEP.

(b) Use of Over Compliance Credits.

1. The owner or operator of a facility may use OCCs to offset any excess GHG emissions, including OCCs acquired from another facility, as long as those OCCs are transferred into the facility's OCC Registry account pursuant to 310 CMR 7.77(5)(d) prior to the compliance deadline.
2. OCCs may only be used by facilities and may not be used by a facility for any purpose other than satisfying the compliance requirements of 310 CMR 7.77(7).
3. The owner or operator of a facility may retain OCCs in an OCC registry account for use or transfer in future years.

(c) Recording of Over Compliance Credits in the GHG OCC Registry.

1. OCCs exist solely as an accounting mechanism and are not property rights.
2. The owner or operator of each facility must keep records for 5 years for any OCCs created by the facility.
3. The owner or operator of the facility that creates OCCs shall establish an account in the OCC registry.

(d) Transfer of Over Compliance Credits.



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1. Any owner or operator of a facility that creates OCCs in accordance with the 310 CMR 7.77(5)(a), may transfer OCCs to another facility by submitting a Notice of Transfer to the Department.
2. The Notice of Transfer shall include the facility's OCC registry account number, the amount of OCCs to be transferred, the serial number of the OCCs to be transferred, the name and account number of the facility acquiring the OCCs, and the certification statement at 310 CMR 7.77(9)(c) signed by the Designated Representative allowing the transfer of OCCs.

(6) GHG Emissions Reporting. By April 15, 2019, and each year thereafter, the owner or operator of a facility shall electronically report to the Department on a form provided by the Department the facility's actual GHG emissions that it reported to EPA in accordance with EPA's GHG Reporting Program. The report shall include:

- (a) The name, address, contact person, and phone number of the facility;
- (b) The name, address, email address and phone number of the owner and operator of the facility;
- (c) The facility's actual GHG emissions for the previous calendar year as reported to EPA's GHG Reporting Program;
- (d) A statement from the Designated Representative stating the following: "I certify that I have personally examined the information that I am submitting and I am familiar with the information submitted and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate and complete. I am aware that there are significant penalties for submitting false information, including possible fines and imprisonment.";
- (e) The name and title of the designated representative; and
- (f) The electronic signature of the designated representative submitting the form.

**Commented [EW15]:** See comment above re the need to establish an independent MA GHG reporting requirement in the event the US EPA's discontinues GHG reporting requirements.

**Commented [e16]:** See comment about referencing federal regulations above.

[NOTE: MASSDEP REQUESTS COMMENT ON WHETHER IT IS APPROPRIATE TO BASE COMPLIANCE ON REPORTS SUBMITTED TO US EPA, OR WHETHER IT MAY BE APPROPRIATE TO EXEMPT CERTAIN EMISSIONS, SUCH AS METHANE EMISSIONS OR EMISSIONS OF BIOGENIC CARBON DIOXIDE.]

**Commented [e17]:** ELM does not feel it appropriate to condition compliance on a federal program that may be terminated. See comment about referencing federal regulations above.

(7) Compliance.

- (a) Compliance Deadline. By June 15, 2019 and each year thereafter, the owner or operator of a facility subject to 310 CMR 7.77 shall demonstrate compliance with the facility's emission cap by submitting a compliance certification report covering the prior calendar year in accordance with the requirements in 310 CMR 7.77(7)(b).
- (b) Compliance Certification Reports. The compliance certification report shall be submitted electronically on form provided by the Department and shall include, but not be limited to the following:

**Commented [EW18]:** Exempting biogenic CO2 units is acceptable.

1. The name, address, contact person, and phone number of the facility;
2. The name, address, email address and phone number of the owner and operator of the facility;

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3. The facility's GHG emissions cap for the previous calendar year;
4. The facility's actual GHG emissions for the previous calendar year as reported to EPA's GHG Reporting Program;
5. The facility's excess GHG emissions;
6. The number of OCCs the facility certified in the previous calendar year;
7. The total number and serial numbers of OCCs in the facility's OCC Registry account that the owner or operator of the facility needs to use to offset its excess GHG emissions, if any;
8. The total number of OCCs remaining in the facility's registry account;
9. A statement from the Designated Representative stating the following: "I certify that I have personally examined the information that I am submitting and I am familiar with the information submitted and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate and complete. I am aware that there are significant penalties for submitting false information, including possible fines and imprisonment.";
10. The name and title of the designated representative; and
11. The electronic signature of the designated representative submitting the form.

(c) Compliance Verification. The Department may verify compliance by whatever means necessary, including but not limited to:

1. Inspection of the facility's operating records;
2. Obtaining information about the creation or transfer of OCCs;
3. Obtaining information about the facility's GHG emissions from EPA's GHG reporting program and the Department's GHG reporting program under 310 CMR 7.71;
4. Testing emission monitoring devices; and
5. Requiring the person who owns or operates the facility to conduct emissions testing under the supervision of the Department.

(8) Recordkeeping. The owner or operator of a facility shall keep all records, data, reports and other information required by 310 CMR 7.77 on site for five years.

(9) Authorized Designated Representative.

- (a) Each owner or operator of a facility shall authorize one Designated Representative to act on behalf of the owner or operator with regard to all matters under 310 CMR 7.77.
- (b) The designated representative shall submit electronically a Certification of OCCs, a Notice of Transfer of OCCs, a GHG Emissions report, and the Compliance Certification Report in a format prescribed by the Department.
- (c) When submitting documents to the Department the designated representative shall include the following statement: "I certify that I have personally examined the information that I am submitting and I am familiar with the information submitted and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate and complete. I am aware that there are significant penalties for submitting false information, including possible fines and imprisonment."

**Commented [e19]:** See comment about referencing federal regulations above.

**Commented [e20]:** See comment about referencing federal regulations above.

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(10) Penalties and Enforcement.

(a) If the owner or operator of the facility fails to offset any excess emissions by the compliance deadline, then the owner or operator shall be responsible for transferring to the Department three ~~OCCs~~ OCCs for every one ton of excess GHG emissions.

(b) The penalty provisions in 310 CMR 7.77(10)(a) are in addition to any applicable enforcement provisions.

(c) The Department shall enforce the requirements of 310 CMR 7.77 in accordance with applicable federal and Massachusetts law, including but not limited to M.G.L. c. 21A, sec.16; M.G.L. c. 111, sec. 2C; M.G.L. c. 111 secs. 142A through 142M; M.G.L. c. 21N sec. 7(d), and 310 CMR 5.00.

(11) Program Review. Not later than December 31, 2021, the Department shall complete a review, including an opportunity for public comment on the program review, of the requirements of 310 CMR 7.77 to determine whether the program should be amended. This review shall evaluate actual GHG Emissions, the achievement of the legal requirements of the Global Warming Solutions Act and the achievement of a 25% reduction of 1990 levels of CO<sub>2</sub>e by 2020, the emission caps assigned to existing and new facilities, the process for creating OCCs, the number of OCCs created and banked for future use in the OCC registry, costs of OCCs, and any other information relevant to review of the program.

## MassDEP Clean Energy Standard Discussion Document

### Comments from the Environmental League of Massachusetts (ELM)

November 21, 2016

MassDEP seeks stakeholder feedback regarding options for implementing a Clean Energy Standard (CES). This CES draws on stakeholder engagement and technical analysis that informed development of the 2015 proposal. The 2015 proposed regulation, along with background information regarding the regulation development process is available on MassDEP's web page at the following link:

<http://www.mass.gov/eea/agencies/massdep/climate-energy/climate/ghg/ces.html>

As explained in the Technical Support Document published along with the regulatory proposal, the CES would function in a manner similar to, and compatible with, the existing RPS administered by the Department of Energy Resources.

MassDEP welcomes comment on all aspects of a CES, but requests that stakeholders focus comments on the following list of substantive ways in which the CES may differ from the 2015 proposal:

- When should the CES take effect, and should the CES remain in effect until 2050?
  - Because much of the impetus for the adoption of a CES is based on Executive Order 569 and the Kaine decision, it is imperative that the CES go into effect as soon as administratively possible. The longer lead time built into these rules, the less likely they are to help meet the legal requirements, as reiterated and reinforced by Supreme Judicial Court in the Kaine decision, that the Commonwealth achieve a 25% reduction of greenhouse gas emissions from 1990 levels by 2020. Therefore, the latest that the CES should become operative is January 1, 2018. The CES should remain in effect until 2050 to help ensure subsequent Global Warming Solutions Act requirements are met. This will also serve to provide a level of regulatory predictability important for private/public infrastructure investment decisions.
- What should the standard (expressed as a percent of electrical load) be for each year, or how should it be determined?
  - The standards should be set such that the CES, when acting in concert with other regulatory initiatives (e.g. the emissions cap), ensure that by 2020 GHG emissions are 25% less than 1990 levels.
- Should municipal light plants be required to comply?
  - Municipal light plants should be required to comply with the CES. Munnis provide about 13% of the power consumed in the state, and are as vulnerable to the adverse impacts of climate change as the rest of the state. Therefore, to have the best chance at success, the CES should be drawn as broadly as possible and include munnis.
- Should eligibility for clean generators be based on a list of "clean" technologies, or on an emissions threshold? E.g., a percent cleaner than new combined cycle natural gas generation?

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○ To simplify the regulatory processes please consider using the definition of renewable resources used in Vermont: "Renewable energy" means energy produced using a technology that relies on a resource that is being consumed at a harvest rate at or below its natural regeneration rate. (30 V.S.A. § 8002). This definition allows the DEP to avoid issuing a list of clean technologies, that may need continual updates, and also avoids the need to complete complicated computations of percentages of "new" combined cycle natural gas generation.

- How should the list of technologies or the emissions threshold be determined?
- Should eligibility for clean generators be limited to "new" facilities? E.g., should existing hydroelectric generation be allowed for compliance? If so, what should be the cutoff for being considered new? What about transmission capacity for electricity imported into New England?
- Should the CES include flexibility options such as an alternative compliance payment?

**From:** Eric Wilkinson

**Sent:** Wednesday, November 16, 2016 7:59:43 PM (UTC-05:00) Eastern Time (US & Canada)

**To:** Strategies, Climate (DEP)

**Cc:** Nancy Goodman; Eric Wilkinson

**Subject:** Comments on the transportation elements of GWSA 3(d) initial rule proposals

Greetings,

On behalf of the Environmental League of Massachusetts (ELM), I would like to submit these comments on the transportation elements of the Global Warming Solutions Act 3(d) initial rule proposals.

### *Introduction*

ELM is dedicated to protecting the environment of our commonwealth. To that end, we see global warming as one of the most significant challenges we face. Now is the time for bold action, especially in light of the fact that the federal government will likely not much if anything to combat climate change, in fact they may adopt policies that exacerbate the problem.

Therefore, it is time for the states to lead on this issue. ELM is appreciative of the Department of Environmental Protection's efforts to engage stakeholders early on their efforts to adopt new regulations to comply with the Global Warming Solutions Act, Executive Order 569, and the SJC's Kaine decision.

ELM offers these brief and high-level comments on the transportation sections for your consideration.

#### **(1) General transportation 320 CMR 60.05 revisions**

It is somewhat difficult to provide specific comments on this initial proposal as the only information DEP has released here is a power point presentation. See: <http://www.mass.gov/eea/docs/dep/air/climate/3-gwsa-transportation.pdf>

ELM supports the concepts outlined in this presentation, specifically, the concept of declining greenhouse gas (GHG) aggregate limits on the transportation sector. However, ELM reserves the right to provide more specific comments when we can see specific numbers associated with this proposal. Moreover, ELM reiterates the need for bold action that will significantly impact emissions from the transportation sector.

#### **2. State fleet: 310 CMR 60.06 CO<sub>2</sub> Emission Limits for State Fleet Passenger Vehicles**

ELM supports GHG limits on the state fleet. Although the state fleet constitutes a small portion of the vehicles on the road in Massachusetts, it is important for the state to demonstrate leadership by example. Declining aggregate GHG emissions caps on the state fleet are appropriate. ELM recommends that the proposed rules contain provisions requiring DEP to assist other state agencies with technical guidance on ways to reduce GHG emissions from their vehicles. Again, bold action is required and ELM expects to see meaningful aggregate emission reduction requirements from the state fleet in the draft rule proposal.

Respectfully,  
Eric Wilkinson  
Director of Energy and Climate Policy  
Environmental League of Massachusetts

KEEGAN WERLIN LLP

ATTORNEYS AT LAW  
265 FRANKLIN STREET  
BOSTON, MASSACHUSETTS 02110-3113

\_\_\_\_\_  
(617) 951-1400

TELECOPIERS:  
(617) 951-1354  
(617) 951-0586

November 16, 2016

Ms. Sharon Weber  
Deputy Division Director, Air & Climate Programs  
Department of Environmental Protection  
One Winter Street, 7<sup>th</sup> Floor  
Boston, MA 02108

Re: Natural Gas Local Distribution Companies' Joint Comments on Proposed Methane Emissions Regulations

Dear Ms. Weber:

On behalf of the Massachusetts natural gas local distribution companies, specifically Fitchburg Gas and Electric Light Company d/b/a Unitil ("Unitil"), The Berkshire Gas Company ("Berkshire"), Boston Gas Company and Colonial Gas Company each d/b/a National Grid ("National Grid"), Liberty Utilities (New England Natural Gas Company) Corp. d/b/a Liberty Utilities ("Liberty"), Bay State Gas Company d/b/a Columbia of Massachusetts ("CMA"), and NSTAR Gas Company d/b/a Eversource ("Eversource") (collectively, the "LDCs"), please find below the LDCs' Joint Comments in response to the Massachusetts Department of Environmental Protection's ("DEP") request for stakeholder comments on proposed methane emissions regulations.

Thank you for your attention to these Joint Comments. Please contact me directly if you have any questions.

Sincerely,

  
Danielle C. Winter



**COMMONWEALTH OF MASSACHUSETTS**

**DEPARTMENT OF ENVIRONMENTAL PROTECTION**

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)  
Joint Initial Comments filed on behalf of )  
Fitchburg Gas and Electric Light Company d/b/a Unitil, )  
The Berkshire Gas Company, Boston Gas Company and )  
Colonial Gas Company each d/b/a National Grid, )  
Liberty Utilities (New England Natural Gas Company) )  
Corp. d/b/a Liberty Utilities, Bay State Gas Company )  
d/b/a Columbia Gas of Massachusetts, NSTAR Gas )  
Company d/b/a Eversource Energy )

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**JOINT INITIAL COMMENTS OF THE MASSACHUSETTS**

**NATURAL GAS LOCAL DISTRIBUTION COMPANIES**

## EXECUTIVE SUMMARY

In keeping with the Commonwealth's energy policies, Massachusetts natural gas local distribution companies ("LDCs") are substantially reducing greenhouse gas ("GHG") emissions. Annual data demonstrates that emissions from natural gas systems are on the decline and below 1990 levels. As noted in the 2015 Update to the Clean Energy and Climate Plan ("2015 CECP Update"), natural gas system GHG emissions have decreased from three percent in 1990 to one percent in 2012 of total Massachusetts GHG emissions, which far exceeds the reductions contemplated by the Global Warming Solutions Act ("GWSA"). 2015 CECP Update at 4-5, 8 and Figures 2 & 5. In addition, the LDCs' continued planned leak-prone infrastructure replacement will continue to achieve emissions reductions.

Specifically, the LDCs are implementing Gas System Enhancement Program ("GSEP") Plans, pursuant to authorization granted by the Department of Public Utilities ("Department") since January 1, 2015, to accelerate the replacement of aging and leak-prone natural gas pipeline infrastructure pursuant to G.L. c. 164, § 145.<sup>1</sup> The LDCs' GSEPs further the achievement of the goals of the GWSA because reduction of GHG emissions is an important result of the GSEPs.<sup>2</sup> The LDCs' implementation of their GSEPs will result in increasing GHG emissions reductions on an annual basis in a cost and resource efficient manner.

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<sup>1</sup> Prior to the implementation of the GSEPs beginning January 1, 2015, several of the LDCs implemented Targeted Infrastructure Replacement Factors ("TIRFs"), which addressed the removal of leak-prone infrastructure. Regardless of whether an LDC implemented a TIRF, all LDCs have worked to replace leak-prone infrastructure on their respective distribution systems.

<sup>2</sup> See 2015 CECP Update at 105-106 (discussing LDC infrastructure replacement plans).

The LDCs are committed to achieving reductions in GHG emissions through implementation of their GSEPs. The LDCs are also committed to continuing to make GHG emissions reductions part of their business focus. Consistent with the requirements of Section 13 of Chapter 188 of the Acts of 2016, the LDCs are working with the Department, the Massachusetts Department of Environmental Protection (“DEP”) and stakeholders to prioritize the repair of Grade 3 leaks; specifically those Grade 3 leaks that have a significant environmental impact.<sup>3</sup> Through their award-winning energy efficiency programs, the LDCs offer customers the opportunity and means to utilize natural gas efficiently. Additionally, the LDCs facilitate the conversion of customers from home heating oil to natural gas, which carries with it a significant reduction in GHG emissions. The LDCs look forward to working with the DEP to recognize GHG reductions from the natural gas industry and to incorporate the reductions in the DEP’s proposed emissions regulations.

Although the LDCs seek to maximize environmental benefits through their respective capital programs and customer-focused offerings, their paramount commitment must continue to be the provision of safe and reliable service to their customers. As discussed further below, achieving the objectives of the GWSA does not and cannot supersede the LDCs’ statutory public service obligation to provide safe and reliable natural gas service to their customers. A deliberate balance of this critical statutory obligation with the important goals of the GWSA will

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<sup>3</sup> The LDCs recognize that the Department and DEP’s efforts regarding the prioritization of repair of Grade 3 leaks with significant environmental impacts will likely not be completed in time to be incorporated into the DEP’s proposed emissions regulations to be published on December 16, 2016. Once finalized, the ultimate approach to addressing Grade 3 leaks and the method for quantifying the impacts of those repairs must be appropriately reflected in the DEP’s emissions regulations.

lead to emissions regulations that are carefully crafted to achieve the Commonwealth's energy and environmental policies.

## **I. INTRODUCTION**

On May 17, 2016, the Massachusetts Supreme Judicial Court ruled that the GWSA requires the DEP to promulgate new regulations that: (1) impose a limit on GHG emissions that may be released; (2) limit the aggregate emissions released from each group of regulated sources or categories of sources; (3) set emission limits for each year; and (4) set limits that decline on an annual basis in order to meet the requirements of M.G.L. c. 21N, § 3(d) ("Section 3(d)"). Kain v. Department of Environmental Protection, 474 Mass. 278 (2016).

On September 16, 2016, Governor Baker signed Executive Order 569, Establishing an Integrated Climate Change Strategy ("Executive Order"), which directed the Executive Office of Energy and Environmental Affairs ("EOEEA") to coordinate and make consistent new and existing efforts to mitigate and reduce GHG emissions and to build resilience and adapt to the impacts of climate change. The Executive Order directed the DEP to consider limits from, among other sources or categories of sources, leaks from natural gas distribution systems in Massachusetts. Executive Order at 3. Lastly, the Executive Order directed the DEP to promulgate regulations that satisfy the mandate of Section 3(d) to ensure that the Commonwealth meets the 2020 statewide emissions limit mandated by the GWSA. Id.

The Executive Order requires the DEP to publish, no later than December 16, 2016, its proposed regulations consistent with the GWSA, the Kain decision and the Executive Order and to hold, no later than February 24, 2017, a public hearing on the proposed regulations. Id. Pursuant to the Executive Order, the DEP must, no later than August 11, 2017, promulgate final

regulations that satisfy the mandates of Section 3(d) and are designed to ensure that the Commonwealth meets the 2020 statewide emissions limit mandated by the GWSA. Id.

In order to meet the directives set out in Kain and the Executive Order as those directives relate to the reduction of leaks from the natural gas distribution system, the DEP scheduled a series of stakeholder meetings, open to the public, on November 2 and 3, 2016, to present the framework of its proposed regulations concerning limiting the emissions from leaks on natural gas distribution systems. The DEP also encouraged stakeholders to file written comments on the proposed regulatory framework by the November 16, 2016 deadline.

Representatives from the LDCs attended the November 2<sup>nd</sup> and 3<sup>rd</sup> stakeholder sessions. Based on the discussion at those sessions and in recognition of the comment deadline, the following LDCs offer the comments and suggestions contained herein for the DEP's consideration: Fitchburg Gas and Electric Light Company d/b/a Unitil ("Unitil"), The Berkshire Gas Company ("Berkshire"), Boston Gas Company and Colonial Gas Company each d/b/a National Grid ("National Grid"), Liberty Utilities (New England Natural Gas Company) Corp. d/b/a Liberty Utilities ("Liberty Utilities"), Bay State Gas Company d/b/a Columbia of Massachusetts ("CMA"), and NSTAR Gas Company d/b/a Eversource Energy ("Eversource").<sup>4</sup>

The LDCs appreciate the opportunity to offer these comments and suggestions in order to assure that any final regulations designed to limit emissions from the natural gas distribution

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<sup>4</sup> Blackstone Gas Company ("Blackstone"), a Massachusetts LDC, is exempt from the DEP's proposed regulatory framework for limiting emissions from natural gas distribution systems as it does not have a GSEP, which forms the basis of the proposed regulations. Furthermore, Blackstone's distribution system is composed entirely of plastic main, with no steel or cast iron main present on the system.

systems are appropriately and accurately developed. The LDCs look forward to actively participating in the remainder of the DEP's rulemaking proceeding.

## **II. THE LDC PUBLIC-SERVICE OBLIGATION**

The LDCs have a public-service obligation to provide safe and reliable service to their customers at a reasonable cost. NSTAR Gas Company, D.P.U. 14-150, at 307 (2015); New England Gas Company, D.P.U. 10-114, at 76 (2011), citing Report to the Legislature Re: Maintenance and Repair Standards for Distribution Systems of Investor-Owned Gas and Electric Distribution Companies, D.P.U. 08-78, at 4 (2009); Incentive Regulation, D.P.U. 94-158, at 3 (1995). Ensuring that both current and future natural gas customers are provided with safe and reliable service is the heart of the regulatory and oversight mission of the Department. Regulations affecting the LDC distribution systems must be grounded in this fundamental principle and cannot diminish, impair or negate the LDCs' ability to provide safe and reliable service to their customers, both now and in the future.

Consistent with the service and franchise provisions of 220 C.M.R. 14.00 and Department-approved tariffs, the LDCs have the right to expand access to natural gas service. In fact, Massachusetts law expressly authorizes the LDCs to undertake additional efforts to facilitate the extension of natural gas service to new customers. Section 3 of Chapter 149 of the Acts of 2014, An Act Relative to Natural Gas Leaks (the "Act") requires the Department to authorize LDCs to design and offer programs to customers that increase the availability,

affordability and feasibility of natural gas service for new customers.<sup>5</sup> Section 3(a) of the Act authorizes, subject to Department review and approval, LDCs to implement alternative rate mechanisms or company project review methodologies that facilitate access to natural gas service for new off-main customers. Furthermore, the LDCs are authorized to propose, for the Department's review and approval, other cost-effective programs that reasonably accelerate the expansion of and conversion to natural gas usage in the Commonwealth, including programs that are likely to accelerate the conversion or expansion to natural gas usage for low-income consumers currently eligible for the federal Low Income Home Energy Assistance Program ("LIHEAP"). Chapter 149 of the Acts of 2014, §§ 3(b) and (d).

Thus, the provisions of the Act envision and encourage the LDCs to increase access to natural gas resources to Massachusetts customers through greater optimization of the current distribution system and/or gas main expansions. Any final regulations promulgated during the course of the DEP's rulemaking proceeding must work in concert with this statutory authorization and cannot impinge upon, restrict or prevent the expansion of the LDC distribution systems in contravention of the Act.

Within that context, the LDCs recognize the importance of reducing GHG emissions consistent with the mandates of the GWSA and are committed to reducing emissions from the distribution system in a reasonable and practical way. The LDCs are certain that, consistent with the judicial principles of statutory construction, the careful and deliberate development of regulations designed to meet the requirements of Section 3(d), without impinging upon the

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<sup>5</sup> Currently, the Department is in the process of reviewing the Gas Expansion Pilot Program developed by Eversource in D.P.U. 16-79. A decision, pursuant to Section 3(c) of the Act, is expected on or about February 10, 2017.

LDCs' obligation to provide safe and reliable service to current and future customers, will further the Commonwealth's goals to mitigate future climate change. The LDCs' comments and recommendations detailed below are intended to aid in achieving these important goals.

### **III. DEP'S PROPOSED REGULATORY FRAMEWORK**

As delineated in the stakeholder discussion slides<sup>6</sup> that formed the basis of the DEP's stakeholder sessions and the draft regulatory text published by the DEP on November 7, 2016, the LDCs understand that the DEP proposes to develop maximum annual methane emissions for each LDC with a GSEP<sup>7</sup> and an aggregate cap that equals the sum of the LDCs' individual caps.

The DEP has indicated that it intends to develop the individual caps by (1) taking an LDC's miles of main and number of services by type (bare steel, cast iron, etc.) as reported by the LDC to the U.S. Department of Transportation ("USDOT") Pipeline and Hazardous Materials Safety Administration ("PHMSA")<sup>8</sup>, and (2) multiplying the results by the emissions factors developed in the natural gas methane study undertaken by Washington State University, which was partially funded by the Environmental Defense Fund (hereinafter referred to as the "WSU/EDF emissions factors"). DEP has indicated that the individual LDC caps include an on-main growth factor developed using the growth factors reported by the LDCs in their individual forecast and supply plans ("F&SPs") filed with the Department pursuant to M.G.L. c. 164, § 69I.

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<sup>6</sup> A copy of the discussion slides and draft regulatory text can be found at <http://www.mass.gov/eea/agencies/massdep/air/climate/section3d-comments.html>.

<sup>7</sup> GSEPs are LDC-specific plans to repair or replace leak-prone infrastructure, such as bare-steel main and service lines and cast-iron mains, existing on the distribution systems consistent with the directives contained in M.G.L. c. 164, §145. The GSEPs were developed to ensure the accelerated replacement of all LDC leak-prone infrastructure within an accelerated timeframe.

<sup>8</sup> It is unclear from the draft regulatory language what year of PHMSA reports DEP intends to utilize in developing each LDC's miles of main and number of services by type benchmark. The LDCs anticipate that this will be clarified in the draft regulations to be published on December 16, 2016.



The DEP's proposed regulatory framework establishes declining emissions for the length of each LDC's GSEP.

The DEP has encouraged stakeholders to comment on the proposed framework, including whether enforcement should be predicated on achievement of both the individual and aggregate caps and whether its proposed regulations should include the years following 2020. The LDCs are encouraged by the DEP's intention to calculate the individual LDC emissions caps by (1) taking an LDC's miles of main and number of services by type as reported to PHMSA; and (2) multiplying the results by appropriate emissions factors. Although the most direct indicator of methane emissions from the distribution systems would be a measure of lost gas volume, there are no generally accepted industry practices, procedures or technology that readily or accurately measure lost gas volumes from leak-prone infrastructure in a manner feasible for LDC operations. Additionally, since current law and regulation are primarily aimed at preserving the public safety and system reliability, the LDCs do not have procedures in place that involve the collection of data that would be necessary to estimate lost volumes, and relatedly emissions, with any level of precision. Thus, DEP's proposed emissions cap calculation is a reasonable approach that will enable compliance with Kain and the GWSA.

With that in mind, below, the LDCs identify critical concerns with the proposed regulatory framework and recommend solutions to address those concerns.

*1. Calculation of Individual Caps*

As an initial matter, the LDCs note that Table 9, which calculates the Methane Emission Factors by Material Type and is located on pages 6-7 of the draft regulatory text, contains significant calculation errors. Based on the LDCs' review and calculations, the factors appear to

be off by a factor of 1 million and several of the numbers within the table are incorrect. In the table below, the LDCs have recalculated the emissions factors from Table 9 by applying the same conversion to all of the factors and using a Global Warming Potential (“GWP”) of 25. The revised Table 9 has been included below, with redlines included for ease of review.

<b>REVISED Table 9 - Methane Emission Factors by Material Type</b>	
Mains	Metric tons of carbon dioxide equivalent/mile-year
Cast or wrought iron	<del>28,663,225</del> 28.9822023529412
Ductile iron	
Copper	
Steel, cathodically unprotected and uncoated	<del>20,281,978</del> 21.1862480418848
Steel, cathodically unprotected and coated	
Other	
Steel, cathodically protected and uncoated	<del>1,804,054</del> 2.33726021052632
Steel, cathodically protected and coated	
Plastic	<del>215,583</del> 0.84502165787234
Services	Metric tons of carbon dioxide equivalent/service-year
Steel, cathodically unprotected and uncoated	<del>129,589</del> 0.349456796769852
Steel, cathodically unprotected and coated	
Cast or wrought iron	
Ductile iron	
Other	
Steel, cathodically protected and uncoated	<del>55,982</del> 0.0315668269794721
Steel, cathodically protected and coated	
Plastic	<del>5,136</del> 0.00498346666666667
Copper	<del>121,920</del> 0.126144

The LDCs appreciate that the DEP has recognized that it is appropriate to account for distribution system growth in the individual LDC emissions caps. Recognition of system growth, both through new service lines and the addition of new main to the system, within the emissions cap strikes an appropriate balance between the GWSA’s directives and the LDCs’

statutory authority to facilitate expanded access to natural gas service pursuant to Department-approved tariffs, the provisions of 220 C.M.R. 14.00 and the directives of Section 3 of Chapter 149 of the Acts of 2014.

However, the growth identified in the LDCs' individual F&SPs is not the appropriate source to use to reflect growth under the proposed emissions caps. The F&SPs are designed to demonstrate that the LDC's gas-resource planning process has resulted in a reliable gas supply portfolio that meets the combined forecasted needs of customers at low costs. The growth factors contained in the F&SPs do not indicate, in any way, for the miles of main and number of services the LDC may need to add to its respective distribution system to meet expected customer growth. Additionally, the growth factors contained in the LDCs' F&SPs are typically conservative projections consistent with the requirements of the Department and may not accurately reflect actual growth over time. Therefore, the F&SP growth factors should not be used as a source to determine on-main growth factors for the individual emissions caps.

Instead, the LDCs recommend that the DEP appropriately account for forecasted main and service growth in the LDCs' individual service territories by using the LDC-specific growth forecasts included in Appendix A located at the end of these comments. These growth factors more accurately reflect each LDC's expected growth through the expansion of its distribution system infrastructure. The LDCs recommend that the DEP include a main and services growth factor so that the individual LDC emissions caps, and necessarily the aggregate cap, do not inadvertently restrain an LDC's authority to grow its system and customer base consistent with the service and franchise provisions of 220 C.M.R. 14.00, the terms of the LDC's approved tariffs and the directives of Section 3 of Chapter 149 of the Acts of 2014. Such inadvertent

restraints on system growth could compel the need for a service moratorium on new customers.<sup>9</sup> Moratoriums on extending service to new customers frustrates the LDCs' authority to serve customers within their defined service territories consistent with franchise rights and the Commonwealth's clearly delineated goal of facilitating customer access to natural gas service. In order to avoid such a potential conflict between the Commonwealth's emissions reductions goals and natural gas access goals, the LDCs recommend that the DEP appropriately account for forecasted main and service growth across the service territories using the factors contained in Appendix A.

As a corollary to the requirement that both mains and service growth be appropriately accounted for in the development of the individual LDC emissions caps, the cap calculation must also recognize that system growth arising from a customer's conversion from oil to natural gas results in a reduction of emissions. Failure to reflect these emissions reductions is contrary to the Commonwealth's clear preference to promote customer conversions to natural gas. See Clean Energy and Climate Plan for 2020 (2015 Update), at 55-65 (focus on the design and implementation of energy efficiency programs and stretch building codes to effectuate conversions and reduce GHG emissions).

By utilizing appropriate main and service growth factors and an oil-to-gas GHG emissions reduction factor, the DEP will be able to calculate individual LDC emissions caps that better reflect the realities of LDC operations in Massachusetts, along with capturing the

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<sup>9</sup> Berkshire Gas was required to declare a moratorium on the provision of incremental service in its Eastern Division due to factors such as delivery and distribution constraints. Any of the LDCs could be required to declare a similar moratorium in order to comply with the methane emissions regulations, which, in turn, could result in customer frustration. In addition, should Berkshire Gas' moratorium be lifted, it will likely be appropriate for Berkshire Gas to make adjustments to its emissions cap to account for any response to "pent-up" customer demand.

emissions reductions associated with those realities. Calculation of the cap using these additional factors is consistent with the mandates of the GWSA, as reaffirmed by Kain and the Executive Order, to establish a desired level of declining annual aggregate GHG emissions limits. Section 3(d).

In addition to correctly capturing system growth and attendant emissions reductions, the individual LDC emissions caps must also clearly delineate what sources of emissions from the distribution systems are not included in the calculation of the cap. The LDCs appreciate that the DEP's proposed regulations recognize that emissions will inevitably arise from issues outside of the LDCs' control, such as third-party damages to distribution system assets; dig-ins during construction near distribution system assets; acts of vandalism; or emergency events, including but not limited to fires, floods, earthquakes, and weather events such as storms, and that such emissions are appropriately excluded from the individual caps calculated under the DEP's proposed regulatory framework. Although the LDCs take prudent and diligent steps to safeguard distribution system assets from outside impacts, situations arise that are outside of the LDCs' control. The LDCs will continue to take steps to guard against these situations and to mitigate the impact of these situations on the distribution systems; however, emissions increases due to third-party actions or emergency events, as evidenced by the DEP's proposed regulatory framework, are appropriately excluded from the calculation of the LDCs' individual emissions caps.

The LDCs also encourage the DEP to utilize the U.S. Environmental Protection Agency (“EPA”) emissions factors as the basis for calculating the individual LDC emissions caps.<sup>10</sup> The LDCs currently rely on the EPA emissions factors for the EPA’s Subpart W annual reports concerning emissions associated with natural gas distribution systems. The EPA emissions factors have been peer-reviewed and have been determined to be accurately calculated. Use of the EPA emissions factors would result in consistent calculation and reporting of distribution system emissions.

Lastly, the individual emissions caps cannot be set at a level below the minimum emissions for a distribution system composed of plastic and coated steel main. As indicated by the DEP, the emissions caps are tied to each LDC’s GSEP, all of which set out the LDCs’ plans to replace all leak-prone, e.g. bare steel and cast iron, infrastructure with plastic and coated steel. Execution of GSEPs will result in significant reduction of GHG emissions, but the DEP, and consequently the individual emissions caps, must recognize that and account for a certain level of emissions associated with a distribution system composed of plastic and coated steel mains, services and ancillary facilities. These emissions are unavoidable as there is no alternative “emissions-proof” mains and services material available to use in place of plastic and coated steel. Given that the LDCs are operationally unable to mitigate or eliminate the emissions associated with a distribution system composed of plastic and coated steel mains, services and ancillary facilities, the individual emissions caps developed following the completion of the GSEPs cannot be set at a level below the minimum amount of emissions expected from the

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<sup>10</sup> Please note that both National Grid and CMA support the DEP’s proposed use of the WSU/EDF emissions factors. Berkshire Gas and Liberty Utilities do not oppose the use of the WSU/EDF emissions factors.

reconstructed distribution systems. Setting an emissions cap below the minimum amount of emissions associated with plastic and coated steel infrastructure produces an unacceptable outcome because it will be impossible for the LDCs to comply with the emissions cap. Such a result is wholly inappropriate and contrary to the intent of the GWSA, which seeks to set ambitious but achievable emissions reductions.

## 2. *Compliance and Enforcement*

Given that an individual LDC is able to undertake actions (such as implementation of its GSEP)<sup>11</sup> only in relation to the reduction of emissions on its own distribution system, any determination of compliance and related enforcement actions must be tied solely to an LDC's management of its distribution systems under its individual emissions cap. The LDCs work collaboratively on a variety of issues affecting their industry and regularly share lessons learned and best practices; however, the LDCs exist as separate legal entities with no ability to dictate or enforce another LDC's actions or inactions. This represents a risk of non-compliance that an LDC cannot manage, mitigate or eliminate. This inability to address the risk renders compliance with the aggregate<sup>12</sup> emissions cap and any enforcement actions arising from non-compliance with the aggregate cap inappropriate and inequitable.

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<sup>11</sup> Although the LDCs' GSEPs share many of the same characteristics and were developed consistent with the requirements of M.G.L. c. 164, §145, the GSEPs are individual operating plans. Section 145 sets out the same goals for all of the LDCs, i.e. the repair or replacement of all leak-prone infrastructure, but it does not create a joint, statewide plan for leak-prone infrastructure replacement, unlike the statewide energy efficiency plans and programs developed by the Massachusetts electric and gas distribution companies pursuant to M.G.L. c. 25, §§ 19, 21-22, and c. 25A, §11G.

<sup>12</sup> The DEP has indicated that the aggregate emissions cap is simply the sum of all of the individual LDC emissions caps.

The DEP can fully meet the requirements of the GSWA, as affirmed by Kain, regarding limiting the aggregate GHG emissions released from a sector without determining an LDC's compliance with both its individual emissions cap and the aggregate cap and undertaking enforcement actions related to non-compliance with the individual and/or the aggregate cap. Section 3(d) of the GWSA required the DEP to promulgate regulations that establish a desired level of declining aggregate GHG emissions limits. The DEP will meet this requirement through the establishment of the individual caps, which taken as a whole, assuming compliance, will result in declining aggregate emissions.

Neither the GWSA nor the Kain decision requires the DEP to determine an individual entity's compliance with both its individual cap and the aggregate cap and then undertake appropriate enforcement actions against that entity depending on non-compliance with the individual and/or aggregate cap. In this instance, the aggregate cap should be used solely as an informational tool to demonstrate that, as a whole, the LDCs' individually enforceable emissions caps result in declining annual aggregate emissions limits. The DEP's use of the aggregate cap in this manner meets the requirements of Section 3(d) without impermissibly punishing LDCs for actions beyond their control, specifically the actions or inactions of a fellow LDC in managing its performance under its individual cap.

As noted above, the DEP has indicated that it intends to use the LDCs' individually developed and administered GSEPs as the starting point to develop the individual emissions caps. The GSEPs, as recognized by the Department, were developed with a degree of flexibility to account for unforeseen operational or other circumstances, such as contractor scarcity, street opening moratoriums, weather, and other factors that may affect an LDC's ability to complete its



estimated miles of main/number of services replacements in any given year. The GSEPs represent a 20 to 25-year commitment by the LDCs to accelerate the removal of leak-prone infrastructure and, while the Department evaluates an LDC's actual replacements in a given year, the LDCs are managing their replacement activities under the accelerated 20-25 year timelines approved by the Department.

The DEP has indicated that it intends to use the miles of main figures reported by the LDCs to PHMSA to develop the emissions cap. As an initial matter, if the DEP ultimately decides to rely on the data reported to PHMSA in the proposed regulations, it must include a provision that enables the LDCs to address recordkeeping adjustments that an LDC may need to make to the data reported to PHMSA to ensure that the reports accurately reflect all main replacements completed each year by material type.

In the event that an LDC is prevented from replacing all of its estimated miles of main/number of services during a given GSEP year due to: (1) operational determinations that alternate replacement activities were required to ensure safety and reliability of the system, or (2) circumstances beyond its control, it will be unable to manage its performance under its individual emissions cap. In order to avoid the untenable situation where an LDC is subject to an enforcement action for non-compliance with the DEP's regulations due to the need to undertake operationally necessary alternate replacement activities or due to circumstances beyond its control, the DEP must include provisions for a waiver from its regulations and/or a mechanism allowing for a recalculation of an LDC's individual emissions cap to reflect actual circumstances, such as changes to an LDC's GSEP, including but not limited to the extension of the overall GSEP timeline for complete replacement of leak-prone infrastructure. Under such a

waiver/recalculation mechanism, an LDC would be required to present sufficient data and supporting documentation to the DEP justifying the need for the requested waiver or cap recalculation. Utilizing a waiver/recalculation mechanism ensures that the DEP's regulations recognize the need for inherent flexibility in the GSEPs to account for and react to operational needs and circumstances beyond an LDC's control without negatively impacting an LDC's core obligation to provide safe and reliable service to customers.

Similarly, the DEP's regulations must include a mechanism to allow an LDC to seek a recalculation of its individual emissions cap in the event that actual service line and/or new main growth is greater than the original growth factor embedded in the emissions cap.<sup>13</sup> Depending on actual growth rates as compared to estimated rate, required compliance with the cap may impermissibly impinge upon an LDC's ability to facilitate access to natural gas service to new customers, leading to potential moratoriums on service to new customers. Under this recalculation mechanism, an LDC would be required to demonstrate and support actual system growth.

Additionally, the LDC would need to demonstrate that, even under a recalculated growth factor, its recalculated individual emissions cap would result in declining annual emissions on its system. Incorporating a growth factor recalculation provision in the DEP's proposed regulations ensures that: (1) the DEP is compliant with the directives of Section (d) and Kain; (2) an LDC is continuing to demonstrate declining emissions from its systems; and (3) the regulations do not conflict with an LDC's authority to facilitate natural gas service to new customers consistent

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<sup>13</sup> Such a recalculation would necessarily result in a recalculation of the oil-to-gas conversion emissions reduction credit to be incorporated into the revised individual emissions cap.

with the service and franchise provisions of 220 C.M.R. 14.00, the provisions of the LDCs' approved tariffs, and the directives of Section 3 of Chapter 149 of the Acts of 2014.

Lastly, the draft regulatory text circulated by the DEP on November 7, 2016 included individual emissions caps developed for 2015 through 2017. Given that the enforcement provisions of the draft regulatory text do not indicate that compliance with and enforcement under the emissions cap regulations commences on a date certain, e.g. January 1, 2018, following the promulgation of final regulations on August 11, 2017, the LDCs interpret the DEP as applying the caps, and any potential enforcement actions, retroactively. If accurate, such retroactive application is inappropriate since the LDCs will be unable to assess their individual GSEPs through the lens of final, LDC-specific emissions caps to ensure that the GSEPs are being administered in a manner that will enable the LDC to remain below the cap. Any enforcement action resulting from non-compliance with the final emissions cap regulations prior to their adoption and publication by the DEP on August 11, 2017, including the imposition of civil administrative penalties pursuant to G.L. c. 21A, § 16, G.L. c. 111, § 2C, G.L. c. 111 §§ 142A through 142M, and G.L. c. 21N § 7(d), would be impermissibly punitive and unjust. To avoid such a result, the timeframe for compliance with and enforcement under the finalized regulations should commence January 1, 2018.

By determining compliance and enforcement on an individual LDC basis and incorporating the narrowly tailored waiver/recalculation recommendations described above, the DEP will develop regulations for the natural gas sector that appropriately balance the LDCs' competing obligations related to safety and reliability, their authorization to facilitate access to natural gas and reduce GHG emissions from their individual distribution systems. Careful

attention to the appropriate balance will result in regulations that accomplish the Commonwealth's energy and environmental goals to the benefit of all.

3. *Timeframe for LDC emissions caps*

The DEP has requested that stakeholders provide comments as to whether the proposed regulations should include the years following 2020. The GWSA required the DEP to promulgate regulations "not later than January 1, 2012, which regulations shall take effect on January 1, 2013, and shall expire on December 31, 2020." Global Warming Solutions Act of 2008, Acts of 2008, Chapter 298, § 16. The Executive Order requires the Secretary of the EOEEA to continue to consult with the GWSA Implementation Advisory Committee regarding recommendations on establishing statewide GHG emissions limits for 2030 and 2040 by December 31, 2020 and December 31, 2030, respectively. Executive Order at 2. Furthermore, Section 5 of the Executive Order states that its provisions shall be reviewed no later than December 31, 2019 and every five years thereafter. *Id.* at 5.

Based on the timelines set out in the GWSA and the Executive Order, it appears clear that the DEP's regulations should include emissions caps for 2018 through 2020, with a review of the regulations and the associated emissions caps undertaken in 2020. During the 2020 review, the LDCs will be able to provide additional data regarding growth projections and the implementation of the GSEPs during their initial five years, which will allow for greater accuracy in determining progress towards reducing GHG emissions consistent with the GWSA.

The draft regulatory text circulated by the DEP on November 7, 2016 included the provision for the calculation of emissions caps through 2034 and 2038, depending on the length of an LDC's GSEP. Developing the caps so far into the future without any data supporting the

cap calculation is of concern given that the LDCs will continue to gather information on growth and GSEP implementation throughout this period. Additionally, calculating the caps through 2034 and 2038 assumes that the GSEPs will not be updated or revised, pursuant to Department authorization, to reflect the impact of factors such as contractor availability, weather, etc. Given that the LDCs have only recently begun implementing their GSEPs, it is unknown whether and when such updates or revisions would be undertaken to ensure the continued acceleration of leak-prone infrastructure.

In order to avoid a potential situation where the calculated cap is not reflective of actual circumstances, the LDCs suggest calculating the cap through 2020, pursuant to Section 16 of the GWSA, and revisiting the cap calculation and underlying data during 2020 for future implementation. This recalibration is consistent with the mandates of the GWSA that require the DEP to develop regulations that ensure the rigorous and consistent accounting of emissions. G.L. c. 21N, § 2(a)(6). The required rigor and consistency will necessarily flow from the use of accurate information reflecting actual growth circumstances and GSEP implementation.

#### **IV. CONCLUSION**

The LDCs acknowledge the DEP's careful and deliberate manner in approaching the development of regulations for the reduction of emissions from natural gas distribution systems consistent with the provisions and directives of the GWSA, the Supreme Judicial Court's decision in Kain and Executive Order 569. The LDCs appreciate the opportunity to file these initial comments during the DEP's rulemaking proceeding and provide industry insight and expertise in order to assist in the development of fair and effective regulations. The LDCs' recommendations outlined in these initial comments will aid in the development on regulations

that appropriately balance the LDCs' competing obligations related to safety and reliability, their authorization to facilitate access to natural gas and reduce GHG emissions from their individual distribution systems. The LDCs look forward to continuing to participate in the DEP's rulemaking.

Respectfully submitted,

**Boston Gas Company  
and Colonial Gas Company  
each d/b/a National Grid**

By their Attorney,



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Camal O. Robinson, Esq.  
National Grid  
40 Sylvan Road  
Waltham, MA 02451  
(781) 907-3336

**NSTAR Gas Company d/b/a  
Eversource Energy**

By its Attorney,



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Danielle C. Winter, Esq.  
Keegan Werlin LLP  
265 Franklin Street  
Boston, MA 02110  
(617) 951-1400

**The Berkshire Gas Company**

By its Attorney,

/s/ James M. Avery

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James M. Avery, Esq.  
Pierce Atwood LLP  
100 Summer Street, Suite 2250  
Boston, MA 02210  
(617) 488-4125  
(617) 824-2020

**Bay State Gas Company d/b/a  
Columbia Gas of Massachusetts**

By its Attorney,

/s/ Shaela McNulty Collins

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Shaela McNulty Collins, Esq.  
NiSource Corporate Services Company  
4 Technology Drive, Suite 250  
Westborough, MA 01581  
(508) 836-7038

**Liberty Utilities (New England Natural  
Natural Gas Company) Corp. d/b/a  
Liberty Utilities**

By its Attorney,



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Ronald J. Ritchie, Esq.  
Liberty Utilities  
36 Fifth Street  
Fall River, MA 02722  
(774) 627-2910

**Fitchburg Gas and Electric Light  
Company d/b/a Unitil**

By its Attorney,



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Gary Epler, Esq.  
Unitil Service Corp.  
6 Liberty Lane West  
Hampton, NH 03862  
(603) 773 6440

Dated: November 16, 2016

## APPENDIX A PROJECTED GROWTH RATES

### Bay State Gas Company d/b/a Columbia Gas of Massachusetts

<i>Year</i>	<i>Main (feet)</i>	<i>Services</i>
2017	224,025	4,375
2018	229,528	4,485
2019	235,719	4,609
2020	246,725	4,829
2021	254,979	4,994

### Berkshire Gas Company

Year	Main (feet)	Services
2016	6,000	400
2017	6,000	400
2018	6,000	400
2019	6,000	400
2020	6,000	400

### Boston Gas Company and Colonial Gas Company each d/b/a National Grid

Services:

Customer Type	FY12	FY13	FY14	FY15	FY 16	FY 17	FY 18
Residential	6,102	6,730	7,410	6,911	6,356	4,345	4,767
Commercial	700	568	683	598	(included above)	422	(included above)

Main (in feet):

Customer Type	FY12	FY13	FY14	FY15	FY16	FY17	FY 18
Residential	103,917	97,198	114,707	157,911	151,000	161,503	160,000
Commercial	56,190	59,054	45,278	39,027	(Included above)	(Included above)	(Included above)

National Grid plans to add approximately 5 to 6 percent to the services and main installations year over year through FY20.



**APPENDIX A**  
**PROJECTED GROWTH RATES**

Fitchburg Gas and Electric Light Company d/b/a Unitil

Year	Main (feet)	Services
2016	6,500	120
2017	6,500	120
2018	6,500	120
2019	6,500	120
2020	6,500	120

Liberty Utilities (New England Natural Gas Company) Corp. d/b/a Liberty Utilities

<i>Year</i>	<i>Main (feet)</i>	<i>Services</i>
2016	21,500	367
2017	22,980	383
2018	24,000	400
2019	25,380	423
2020	27,000	450

NSTAR Gas Company d/b/a Eversource Energy

<i>Year</i>	<i>Main (feet)</i>	<i>Services</i>
2016	108,000	2,300
2017	150,000	2,800
2018	165,000	3,000
2019	180,000	3,400
2020	200,000	3,700

**From:** Joel Wool

**Sent:** Monday, November 21, 2016 3:16:43 PM (UTC-05:00) Eastern Time (US & Canada)

**To:** Strategies, Climate (DEP)

**Subject:** Comments on Clean Energy Standard, 3(d) regs

Good afternoon:

Clean Water Action is pleased to support the proposed Clean Energy Standard (CES) with qualifications to ensure the designation has meaningful impact on uptake of clean energy programs. The CES can be a critical tool in accelerating our power transition, combating climate change and in ensuring all regions of the state have access to affordable, green power.

The CES should reflect a long-term commitment - applied through 2050 in the current regulations, and should also "look forward" by setting its eligibility date to technologies deployed in 2017 and beyond. The CES should also extend to cover the municipal utilities, which are left out of many clean energy programs and whose absence from clean energy offerings inhibits the success of the state's climate's goals as well as "muni" customers' ability to go green.

The Department of Environmental Protection should also require measures beyond those currently proposed. Most notably, DEP should seek to incent or require energy efficiency beyond the requirements of the state's 3-year energy efficiency plans. The Attorney General of the Commonwealth and many other parties have recognized we can go much deeper on conservation and demand response, and such technologies are the most cost-effective for ratepayers. DEP should also look at emerging renewable technology including storage.

Finally, the DEP should **EXCLUDE** non-RPS hydro and nuclear generation from consideration under the proposed standard.

Thank you for your time and we look forward to future engagement.

Regards,

Joel Wool

Advocate: Energy & Environment

Clean Water Action

[www.cleanwateraction.org/ma/](http://www.cleanwateraction.org/ma/)

88 Broad St, Lower Level, Boston, MA 02110

Cell: 978-697-0361

Office: 617-338-8131

Fax: 617-338-6449

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**From:** David Zeek

**Sent:** Wednesday, November 16, 2016 5:23:25 PM (UTC-05:00) Eastern Time (US & Canada)

**To:** Strategies, Climate (DEP)

**Subject:** Additional Comments for Department of Environmental Protection Hearing on Executive Order 569

The Massachusetts Chapter of the Sierra Club (MASC) hereby submits additional comments on the Department of Environmental Protection's consideration of Governor Baker's Executive Order 569, Establishing an Integrated Climate Change Strategy for the Commonwealth. The Sierra Club is the oldest and largest non-profit, non-partisan environmental organization in the country. With over a forty-year history, the Massachusetts Chapter of the Sierra Club represents over 60,000 members and supporters throughout the state and nearly one million nationwide. We fight for clean energy, clean air, clean water, the preservation of the Commonwealth's natural spaces, and environmentally and economically healthy, vibrant and sustainable communities. These comments focus on the measurement and tracking of emissions from the natural gas distribution system.

Figure 11, Historical and projected emissions (MMTCO<sub>2</sub>e) from leaks in the natural gas distribution system, in the 2015 update to the "Massachusetts Clean Energy and Climate Plan" reflects a change in the year 2014 to the emissions factors used to calculate natural gas emissions based on the natural gas pipe material. The effect of the change was a dramatic reduction in the estimated emissions from the natural gas infrastructure. As explained at the DEP stakeholder hearing on Nov. 2, this change was a result of new factors developed through a national study of pipe materials and emissions. Assuming that the new factors are correct, DEP should restate the 1990 inventory of natural gas emissions using the revised factors. There is, of course, no actual reduction in emissions caused by the adoption of new factors. If the emissions factors were correct for 2014, then those same factors were correct for 1990 and should be applied to the pipe material inventory in 1990. Correcting the 1990 inventory also requires a recalculation of the emissions reductions goals for 2020 and 2050. Reductions in emissions as a consequence of replacing pipe will then better reflect real progress.

We understand that the new emissions factors came from a study "Direct Measurements Show Decreasing Methane Emissions from Natural Gas Local Distribution Systems in the United States" by Brian Lamb of Washington State University, et al. That study found variability in its data with an upper confidence level for leak rates on the order of three times nominal and largely driven by the existence of a few especially large leaks, or as the study puts it, "The upper confidence limit accounts for the skewed distribution of measurements, where a few large emitters accounted for most of the emissions."

It was not clear from the study how they accounted for the pipe joints, many of which in our area are sealed with dried out vegetable matter.

The study also had a dearth of examples of cast iron pipe leaks which are such bad actors in our area. Supplemental information for the study complained that, "The relatively low number of cast iron measurements is partly due to the fact that there are now many fewer miles of cast iron pipe and in most of the LDCs, it was actually difficult to find cast iron leaks to measure."

It is worth noting that the data that National Grid provided to this study did not include many of the cities with the oldest gas distribution systems like Boston, Charlestown, or Lowell. The cities where measurements were made were mainly suburbs of Boston.

Therefore, we also recommend that DEP conduct its own experiments to measure methane emissions in Massachusetts and correlate the findings to the new published emissions factors. Indeed, the study says that, “Further work on reconciling bottom-up emission inventories with top-down emission estimates is needed to address all of the sources contributing to CH<sub>4</sub> emissions from the natural gas supply chain in urban areas since top-down methods cannot yet provide specific source attributions. These include emissions downstream of customer meters from industrial facilities, commercial structures, and residential housing, emissions from pipeline leaks that migrate into sewer lines and vents, emissions from transmission lines and compressor stations within urban areas, from natural gas vehicles and refueling stations, from liquefied natural gas terminals and storage facilities, or other unidentified sources.”

Finally, the study’s findings that “a few large emitters accounted for most of the emissions” reinforces our earlier comments that the best approach to reducing emissions from the natural gas distribution system is to locate, identify, and fix high-volume gas leaks, a.k.a. superemitters, and that this approach will satisfy requirements on DEP from the Kain decision, Executive Order 569, this summer’s energy bill, support for DPU’s regulations.

Respectfully submitted,  
David Zeek  
Massachusetts Chapter of the Sierra Club  
10 Milk Street, Suite 417 Boston MA 02108-4600  
(617) 423-5775  
[sierraclub.org/massachusetts](http://sierraclub.org/massachusetts)